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ABSTRACT

Intended for K-12 geography teachers, this publication discusses course content and teaching methods for geography instruction. There are ten chapters. The first chapter discusses three educational philosophies which contend that the goals of education are to know, to do, and to be. Chapter 2 examines the nature of geography, discussing four traditions: environmental, spatial, regional, and experiential. The third chapter presents a framework for helping teachers make curriculum decisions. Chapter 4 provides guidelines for multidisciplinary and interdisciplinary social studies programs and gives practical examples, including case studies and learning activities, of ways in which geography could be integrated with the social studies curriculum. The fifth chapter explores ways to bring physical geography--the geography of naturally occurring phenomena such as climate and landforms--into today's geographic curriculum. Chapters 6-9 discuss teaching geography through inquiry, exposition, value strategies, and field and archival methods. Practical examples of each teaching method are provided. Objectives of geographic education in the elementary school are treated in the concluding chapter. (RM)

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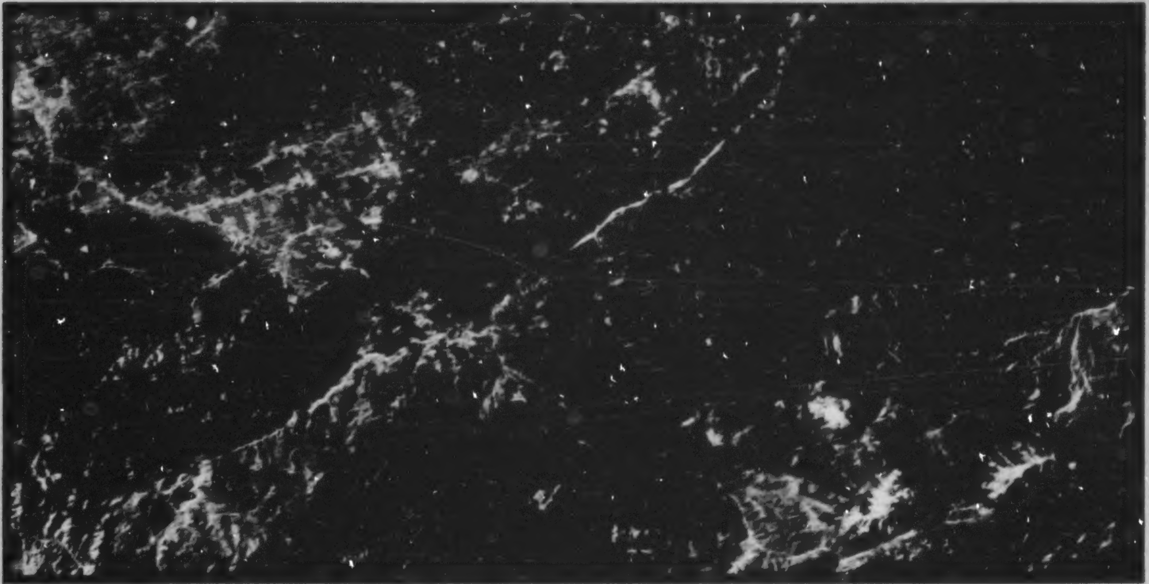
NEW PERSPECTIVES ON GEOGRAPHIC EDUCATION:
putting theory into practice

EDITED BY:
GARY A. MANSON
MERRILL K. RIDD



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Series Editor, Merrill K. Ridd

New Perspectives On Geographic Education

Putting Theory Into Practice

Edited by
Gary A. Manson
and
Merrill K. Ridd

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Foreword

Over the past decade, geographic educators have reexamined both the nature of geography and their methods of teaching. This concern is reflected in curriculums that attempt to look at the learner, the nature and scope of geography, and teaching strategies. The National Council for Geographic Education has long been concerned with the problems of developing curriculum in geography and "New Perspectives on Geographic Education: Putting Theory into Practice" reflects their continued interest.

Geographers are far from unanimous when asked "What kind of Geography" should be included in the school curriculum. However, they tend to agree that geographers have a distinctive contribution to make to the school curriculum. They have important ideas, insights, skills, and approaches that built into the curriculum, will enlarge the students' understanding of human society and of the natural world. The "New Perspectives on Geographic Education: Putting Theory into Practice" discusses the nature of the geographers' distinctive contribution to the students' education.

The variety of materials that the National Council for Geographic Education provides the geography teacher reflects the various needs of teachers who are struggling to develop a relevant but dynamic curriculum. The council through its regional and national meetings, its Journal, and publications such as this volume, will continue to give leadership and direction in geographic education.

The council sincerely appreciates the many contributors to this volume and hopes that their ideas and suggestions will stimulate further examination of the role of the geography curriculum in the achievement of the goals of education.

Herbert A. Augustine, President
National Council for Geographic Education

Preface

All teachers must answer two basic questions. *What* shall I teach? *How* shall I teach it? What to teach refers to content, or the facts, ideas, and skills to be learned by the students. Because students cannot learn everything, the question of content really comes down to the issue of which facts, which ideas, and which skills are most important for the students to learn. The selection of "what to teach" combined with "how to teach it" will have an influence on the nature of the attitudes developed by the student. Resolving that issue is one of the most difficult tasks facing anyone involved in teaching and learning.

How to teach refers, of course, to methods, which include lecturing, discussing, questioning, simulating, and a host of other strategies and techniques. The significance of method is suggested by oft-repeated claims such as "How you teach is as important as what you teach," or "The medium, meaning the way teachers teach, is the message, meaning what the kids learn." We do not know if these claims are valid. However, we do know there are many effective ways of teaching.

This volume speaks to questions of what to teach and how to teach in the context of precollegiate education. Unanimity does not prevail among the authors as it does not prevail in other areas of the curriculum, and rather diverse responses to those questions are offered. In fact, Knos suggests these are probably the wrong questions because they stress the teacher and teaching, not the learner and learning. Cirrincione and Decaroli hold the view that these are complex questions best answered in particular situations by teachers in the role of action researchers. Asmussen and Buggey advocate inquiry as a teaching strategy, whereas Stoltman and Steinbrink suggest some examples of exposition. Thus, anyone turning to this volume for definitive answers to the questions of what to teach and how to teach will be sorely disappointed. However, anyone searching for ideas related to content and method for geographic education will be richly rewarded by a careful consideration of these articles.

During the initial stages of developing *New Perspectives on Geographic Education,* we asked the authors to do two things. First, we asked them to present simply and briefly the theoretical ideas underlying their assigned topic. In our opinion, nothing is more useful than a good idea, and we believe many of the ideas presented in the following pages will prove eminently useful to geographic educators. But the presence of theoretical ideas means that certain portions of the volume may require careful study and thoughtful analysis; indeed, the brevity of some discussions may lead the interested reader to other sources on the topic.

Our second request to the authors was that they implement their ideas through examples; in other words, put their theory into practice. Providing examples is, of course, a necessary stage in explaining ideas, but beyond that, we felt that teachers would appreciate activities and materials that they could try out in their classrooms. Consequently, most of the chapters contain sample lessons and illustrations designed for immediate use in the classroom. Our hope is that these ideas and examples will prompt others to experiment and develop even better approaches to geographic education.

Gary A. Manson
Merrill K. Ridd

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On Learning

Duane S. Knos
Clark University

In an article that appeared in the 1971 Yearbook of the National Council for Geographic Education, William Pattison presented three philosophic positions underlying the process of education.[1] The thrust of these three philosophies revolves around the goals (1) to know, (2) to do, and (3) to be. The development of educational philosophy and practice over many years has included debate over the relative merits of each of these goals as a continuing and, at times, acrimonious theme. Pattison effectively reflected these quarrels in detailing each of these goals in terms of geographic education, and further related them to the nature of geography and its four traditions as functional components of the social studies movement.

This chapter extends beyond the thrust of Pattison's article by considering the substance of the three philosophies, not as conflicting but as complementary goals in the process of learning. To do this the history of education, reformulating the arguments for and against each polarized position, is not retraced here. The assumption is that each goal has its own legitimacy in the educational process, and an attempt is made to find an integrating model. A parable is used to illustrate the problem.

The Parable of a Literate Farmer[2]

There once was a farmer, a literate man, who in his reading, discovered a treatise on the value of manure for the productivity of his farm. The article made exquisite sense, for it explained in detail the effect of the chemical nutrients found in manure on the structure and growth of crops. It also pointed out the economy of keeping the beasts who produce the manure, for they yield a plethora of other useful products—horses for their motive energy, cows for their meat, milk, and cheese, chickens for their eggs and drumsticks, pigs for their hams, sheep for their wool and roasts. Indeed, the suppliers of this diverse fare yield also the means of producing a waxing supply of the feed necessary for their own mission.

The farmer was so excited by his understanding of this signal verity of his universe that he committed himself to the amassing of manure. In his dreams the manure pile was infinite—he visualized himself accumulating more and more manure until his last day, at which time his children would carry on his life's work to make the pile higher and higher and more and more magnificently inclusive. For how could anything so magnificently simple be more elegant than this rotation of feed to manure to feed that was obviously the result of a provident nature's infinite wisdom.

The farmer spent great effort in structuring his pile of manure. He carefully classified it according to type and quality. He analyzed it for its chemical content, its density, its structure. He tested it for its qualities of decomposition, its mixing properties, and its effect on the structure of soil. He observed a multitude of bacteria and insects that took as their milieu the object of his passion, and he marveled at the harmony of their existence. He arranged his manure in a pile in such a way that each type and quality was positioned in a highly rational fashion. Any particular quality could be instantly withdrawn and combined with any other quality to produce a compound more splendid than any predecessor. He became so skilled in his techniques, so competent in his knowledge of manure that his fame spread far and wide. He was most satisfied with his accomplishment, and he felt great joy as he walked around his pile and contemplated its magnificence and his understanding of it.

Now, as was said before, the farmer dreamed that the outcome of his labors would be carried beyond his allotted days. He felt compelled, therefore, to pass on his understanding of manure, so assiduously gained, to his progeny. In his later years, he began to develop ways to transmit his understandings, his techniques, his skills of analysis; to teach his children about manure; and to instill in them a love of the product and a commitment to its study. He described in detail the substance of his pile. He produced diagrams of its structure and exercises dealing with the identification of its elements and compounds. He even took them to the pile itself so that they could observe first hand the substance of his knowledge in its real world setting. He explained in detail the interrelationships that he had discovered between the elements within his pile. He ordered his presentations from the simplest of elements to the most complex of compounds, each being prerequisite for the next consideration. He built models of the mechanisms that account for the relationships so essential to their knowledge of the subject matter, and he used them to explain not once, but several times, the subtleties of his structure. He defined his classifications, making explicit their power, purpose, and logic, and his children were given problems to solve to reinforce their understanding. He told them more than once the story of the development of his pile, reasoning that the lore of their antecedents would offer his children insights into the stewardship of their inheritance. Always he tested them to insure his effect on them. His materials and strategies were models of logic and reasoned planning. By all of his standards of rigor and scholarship, he was a superb teacher.

The farmer was sometimes disturbed, however, because some of his children seemed to respond to his tests properly, but could not seem to carry on their learning to the frontiers of new knowledge, while others who seemed to be rather imaginative did substantial violence to the structure. The one group of his children could absorb the symbols of his labor, but could not understand his style nor his motivation. The other group could not revere his artifact and, at the same time, practice the art of piling manure in their own creative ways. Sometimes he despaired of his dreams.

Well he might despair. One child continued to point out to him that the crops to feed his animals were not prospering. Indeed, the fields were declining rapidly in productivity since the manure was not being used for its purpose. The farmer, however, did not hear this child, for his pile was so large and so consuming of his effort that he was blinded to the fields beyond. His project atrophied as was its destiny, and the world continued much as it always had.

Commentary

Consider, for a moment, our literate farmer. He was admired by his community, for he was what his community admired. He produced an artifact, a structure of knowledge, that could be monitored and appreciated. His commitment to his enterprise, his skill and creativity in learning, his push to the frontiers of knowledge could be described, studied, and valued. He used his own resources, his own energy and mind, to fashion an individual success. His success was not lost in his own awareness, and he found joy in his enterprise. He was a virtuous man; a man to be revered and emulated.

Still, he was destined to despair for the same reasons that all such men fall victims to their considerable virtue. It is a matter of excellence run rampant. It is *hybris:* that quality of excess within an enterprise which does violence to itself and to its relationships with other worlds of endeavor. It is a field of grain so luxuriant that the crop chokes itself, and its yield is diminished. It is the aggressive righteousness of one culture that motivates it to take up the "white man's burden" to civilize another culture and, in the process, to do violence to that other culture's very being. It is a pride that falls only a tiny millimeter short of arrogance and blinds one to the intrinsic value of others. It denigrates others and destroys trust in their integrity and creativity. It alienates one from another and divorces each from the world of which he is necessarily and obviously a part. The purpose of the enterprise is forfeited, and the power to perpetuate it is lost.

There is our farmer. He has proven himself, both to himself and his community. He has basked in the joy of his own understanding of the appreciative regard he received from others. Is it not true that he has been a man of virtue? The answer is obvious. Then why should others not be as he? What perverse streak so bedeviled his children that they could not be in his image? Some demonstrated that they could master his knowledge. They seemed to know the intricacies of his pile almost as well as he himself. Why, then, were they unable to expand his pile as he would have done had he more time on earth? Other children seemed to exhibit the creativity lacking in the first group and so apparent in their father, but they had no respect for his life's work. They insisted upon tearing down his pile and building their own, often with disastrous results. Why couldn't they accept his knowledge for what it had been judged, tested and true? Why did they seem compelled to waste their days? And what of the one who talked of the fields? Why must that child deal in irrelevancies? The farmer was not a spreader of his pile. That had nothing to do with the structure of his knowledge; spreading should be done by others. First things must come first. Before others can be effective spreaders, they must know something important about what it is that they are spreading. Could anything be more valuable than to discover that knowledge?

The farmer could find no satisfactory answer to his questions from within his own awareness, and he was brought to despair. This is the stuff of tragedy: *hybris* unchecked by a tempering humility that comes from sensing one's place in a large and complex world. It is as though the farmer looked through the eyepiece of a telescope trained on his own venture and drew his own "Texan's map of the world." He saw his enterprise through the distorting lens of his pride and became more and more alienated from the "others," his children, who could have helped insure his dreams. He could not see them as enterprisers of value in and of themselves. To him, some were noncreative, others wasted time tinkering with his knowledge, and still another dealt in irrelevancies. Frustration! "Why can't they just be like me?"

He forgot about his own processes. He began his career with a treatise and an insight, and built a structure of knowledge and value. He did it without a teacher. It was a product of his own invention. His motives were born of a positive aspect of that same *hybris*—the quality of obstinate pursuit that leads to accomplishment. He was an inquirer and a discoverer, and his inquiry came from within himself. He discovered by his own devices. He experienced the frustration of not knowing, and reveled in the joy of understanding. Why couldn't his children be like himself indeed? Why couldn't he *let* them be like himself?

The Goal "To Know"

The answer to the question of why the farmer couldn't let his children be like himself may well lie in the philosophic positions to which Pattison addressed himself in his article. Clearly the farmer committed himself to the goal "to know" when he faced the necessity of passing on his knowledge to his children. His materials were elegant in their logic and scholarship—a product of his considerable intellectual power. His strategies were traditional—tried and true. There was no questionable unorthodoxy in his approach to teaching. He held to the central issue of transmitting to his children the substance of his pile with the single-mindedness of a man convinced of the value of his knowledge. Still he despaired of his efforts, for his children seemed to miss the essence of his knowledge.

The farmer's despair resulted, perhaps, from two difficulties inherent in that traditional strategy. In the first instance, the strategy tends to stifle creativity in the process of learning; in the second instance, it tends to divert the learner from the task of understanding and internalizing the subject content. In the first case, inventiveness, imagination, and intellectual independence are not only ignored but are often discouraged. In the second case, there is a serious question whether many learners learn the subject matter in any useful way at all.

The first case suggests that structured subject matter may inhibit the creative process of learning by providing a set of filters through which the process of thought must be developed. They are a part of one's experience and become increasingly familiar and comfortable. Structured knowledge functions as an area of security, a retreat from the frustrations of the new and the radical. Under these circumstances it is difficult to break the mold—to think divergently, to develop alternative perspectives, to infuse into one's own system of knowing, alien ideas derived from the adventure of discovery.

Dealing primarily with established details, memorizing facts and concepts, the learner may become competent within the specific Doctrine that he sees as his subject matter content.

But the learner is frequently not so successful in asking and answering new questions—questions formulated in different contexts or questions arising from the fields outside the area of the pile. Each concept in his personal system of knowing is unique and particular. Seldom is he able to transfer insights obtained in one context to an analogous context. In a word, he is snared in the same trap as the farmer's first group of children—those who could pass their father's tests, but who could not add anything significant to the pile.

The second case may be more effectively elaborated in metaphorical terms describing the "God" model for the presentation of knowledge. It represents the learning model implicit in many traditional classrooms, and describes in some important respects the farmer's teaching procedures. As such, the God model may be useful in illustrating the mechanism by which learners may be diverted from the intended contract.

The first important thing to understand about the God model is that God tells his children the truth. Everyone knows that God's content is the truth. His words shimmer and sparkle in the beauty of their syntax. Indeed, the glory of his words are so awesome, their meaning so obscure, so defiant of simple understanding, that only the most intellectually gifted can be expected to really understand. Surely such elegance representing such complexity is the product of an omniscient intellect.

Of course, God wants his children to *know* the truth. Truth is power to expand the substance of life, and God is concerned for his children. Indeed, God is insistent that his children understand his words, that they take them into their structure of knowing, that his words be internalized in terms of their authentic behavior. Since God knows, in his infinite wisdom, that learners must be motivated, he promises that if his children understand, they will take up residence in heaven, and if they do not understand, they will be consigned to hell.

Now, heaven is surely a place to which all aspire. It is success, the fulfillment of physical and spiritual needs, a just reward for the respectful achievement of understanding. It is a place of physical comfort and psychic contentment. There is, however, no joy in hell. Hell is the penalty for failure. Perhaps it is a dark room in which a swimming pool filled with molten rock has been installed. Bubbles erupt from the pool and break in mid-air with a flinty "flunk." The bursting bubbles serve to remind the intellectual washout of his abject failure. They follow him forever as an animated report card attesting to his mental incapacity. Hell is failure, a foreclosure on the chances for the development of self-respect and self-fulfillment. Is it any wonder that those who do not understand God's words should seek an alternative way to achieve the reward of heaven?

Such an alternative does exist. God's child simply finds ways to make God *think* he understands. He studies God carefully for hints as to what God thinks are critically important principles. He pores over the scriptures underlining certain important passages, usually with a yellow, felt-tipped pen, which he then commits to memory lest God ask him to recite. He devises a number of rituals designed to placate God's wrath should he err in his recitation. He learns to genuflect, to defer, to be docile in God's presence. He learns these skills effectively and very likely gets to heaven, but he does not understand the content of God's words. He does not internalize them. He cannot bring them to bear on the substance of his own life. His efforts are diverted toward form and away from substance. He has learned, but he has not learned the intended lessons. To the extent that the farmer's first group of children responded correctly to his examinations, how many had simply learned to respond properly to tests and how many understood the content of his pile?

The Goals "To Do" and "To Be"

In his total commitment to the goal "to know," the farmer ignored two processes so important to him in coming to know his pile. He ignored the necessity of learning "to do," and he minimized the development of a sense of joy, power, and freedom which motivated him to make further investments in the pursuit of his knowledge. He became frustrated with his second group of children who were involved in "doing" as they attempted to pile their own piles. He could see only the value of his knowledge and could not instruct them in alternative ways of accumulating their pile. He saw their activity as a rejection of his knowledge and thus lost the opportunity to help them analyze their failures and develop new hypotheses.

The farmer could do no better with the child who pointed out that the crops to feed his animals were not prospering. He could not see any involvement in the world outside the metaphor of his own structured content. He was so deep in the category of study as defined by his pile that he was unable to define a new problem in the context of the child's structure of knowing so that he could bring that child to the relevance of his own knowledge. He forgot that *he* had identified the categories of his pile—that these categories had not existed before his considerable efforts. In forgetting, he lost another opportunity to develop a child motivated to learn. The feeling of joy that resulted from insights derived from his own free learning experience, the sense of competence, the self-actuating pursuit of knowledge—all were denied his children. He could not see the value of his own learning process as a model for his children's learning, and he failed.

Now, what of the goals of "to do" and "to be"? To focus on these two goals, the parable of the farmer might be given a new ending by altering the farmer's strategy for raising his children in his own traditions. Starting with the fourth paragraph of the parable—the one that begins, "Now, as was said before, the farmer dreamed that the outcome of his labor . . . ."—the new ending might go like this.

The Second Ending

The farmer dreamed that the outcome of his labors would be carried beyond his allotted days and felt compelled to prepare his children for their stewardship of his enterprise. Being an introspective man he set about his new task by reflecting at length on his own learning processes. He knew intimately the structure of his pile and he reflected on the usefulness of that structure to order his knowledge, to allow him to think systematically about his subject matter, to derive questions that needed treatment so that his pile might be further expanded. In the course of these musings, it occurred to him that his pile had been built bit by bit and that the nature of each succeeding bit was conditioned by what he had learned before. "Suppose," he asked himself, "I had developed my pile in a different order, deriving my insights from different questions drawn from different contexts and based on different assumptions? Would my pile be as it is now? Is not my pile—its substance and its structure—only a statement, a metaphor, of my unique understanding of this small aspect of the world? Might other piles be as useful, as satisfying, as elegant as my own?" It would be inordinately arrogant, the farmer decided, to answer the last question negatively. It occurred to him that to fit other piles, built from different antecedents, against his own might yield yet another generation of understandings more powerful and magnificent than any he had yet imagined. Thus he came to see himself not only as *master* of a body of knowledge, but as *creator* of his own understanding, and he felt a sense of freedom and power in his own creativity.

The farmer began to talk with his children, to come to know them, to come to understand their unique views of the world and their interests and styles. He shared his own views with them, revealing the frustrations and excitements of his involvement with his pile and the world of which it was a part. The children began to see the intellectually skilled and involved human being who was frequently hidden behind the facade of his formidable reputation. He encouraged them to question events in their own experiences, and he helped them to formulate their questions as problems for study. When questions were not forthcoming, he raised questions of his own, taking care to state them in language and context that they could identify within their own structure of knowing. He reflected with them on their problems, and he helped them design critical experiments to test their ideas for solutions. Together they evaluated the results of their experiments and reflected on the errors of their analyses. They plumbed the pile that represented the farmer's past learning to find guidance for their analyses and to find ways of integrating their contributions into the developing thread of what was known. In the process, they began to evaluate the pile in different contexts and to understand it in different metaphors. They came to see the power of these processes in the development of insights and together they reveled in the delight that accompanied each success. The children came to see their father as an exciting model of a competent, self-actuating, and creative learner—a caring man—a man to be emulated. Thus they came to be what their father was.

The farmer took great joy in the community of his children and in his last days he was content. The community possessed substance, openness, and skill. Could one want more from one's life?

Commentary

In the second ending the farmer was shown not as a man of *hybris,* but rather as a man who understood his own processes. He understood his own unique being, and, as a result, he could value the uniqueness of the others who were so essential to the fulfillment of his dreams. It was an understanding that tempered the imposition of his own rightness on his children with the realization that if such an imposition were to destroy their sense of competence, creativity, and value as human beings, the spirit and purpose of his truth was lost. We speak here of *sophrosyne:* that sense of humility which lets one reach out to another and to accept the other's unique style, motivation, knowledge, and abilities. It allows one to bring his own substance up against another's to search for commonalities and to reflect on apparent disparities. The farmer saw the value of the gentling effect of *sophrosyne* not only because he abhorred the violation of his children's human rights, but because it enhanced his own understanding. It allowed him to project his own being into the content of his children's concerns and, in the process, to achieve insights free of the constraints imposed by dogmas born of his own established structure of knowing. It is this freedom that allowed him to see the world through the wide-angle lens of his children's experiences and to see alternative metaphors for the reality represented by his pile. He rejoiced in his expanded sense of creativity, awareness, and power. The farmer came to see the value of a humility that makes one a part of an enterprise rather than its manipulator, and he was content.

Put another way, the farmer cared for his children. He saw them not as containers to be filled with knowledge, but as human beings with a powerful potential for creative achievement and personal competence. In return, his children began to see in him a humanity that went far beyond his own expertise. He extended his resources to help them with *their* problems, and he helped them to help him with his own. He regarded them with respect and that respect was reciprocated. Together they developed a caring community—a community that not only provided powerful resources for their mutual learning, but also developed interrelationships of mutual trust and concern that provided a saving antidote to individual loneliness and despair. It was in this sense of community that the farmer also found contentment in good measure.

But more than the farmer's own intellectual profit and personal gratification was achieved by the processes he used to train his children for the future cultivation of his enterprise. Because he was a man of knowledge, secure in his sense of competence and skilled in processes of analysis, reflection, and evaluation, he was an effective model for his children to emulate. He was a credible person. He could and did do what he wanted his children to do, and he revealed himself in the process. When he muddled with the question of generating ideas relevant to a problem, his children saw that a competent man can err and turn his errors to advantage.[3] When he experienced the delight of insight, he shared his joy and his children saw that a competent man sees knowledge as more than sober rationality. The farmer questioned, critiqued, and offered alternative ideas as his children worked out their problems, and he helped them to serve him in the same manner. Thus, his children saw that a competent man takes opposition to his ideas as a resource to be used in helping him think, not as a denigration of his being. The father showed his concern and respect for his children and they experienced the power, the warmth, the security of the caring relationship that he nurtured. His children saw that a competent man cares for the quality of the total human experience, not merely a single category represented by his own expertise.

Thus it was that the children came *to know* their father's pile, to understand it in a variety of contexts, and to illuminate and expand it. They came to know by *doing*—by developing, the skills of reflection, analysis, and evaluation. They learned to discover the meaning of facts, concepts, categories, and structures and those meanings became part of them. In the process they came to have a sense of competence and self-worth that let them risk attacking the unknown for whatever insights might be derived. And they came *to be* in their sense of power and freedom that attends the awareness of one's own processes.

An Integrated Learning Model

If the farmer were to describe the structure of the process he used to teach his children, he might sketch the model shown in Figure 1.1. Most likely he would start with a problem—a problem, perhaps, that emanates from an insight, as in his own case

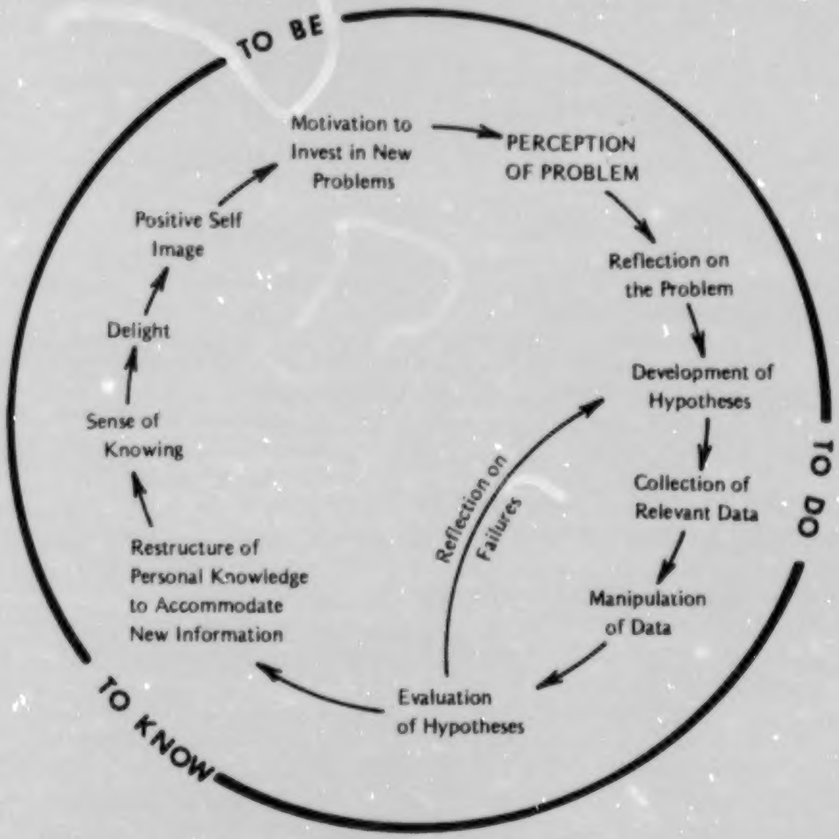
TO BE
Motivation to Invest in New Problems
PERCEPTION OF PROBLEM
Reflection on the Problem
Development of Hypotheses
Collection of Relevant Data
Manipulation of Data
Evaluation of Hypotheses
Reflection on Failures
Restructure of Personal Knowledge to Accommodate New Information
Sense of Knowing
Delight
Positive Self Image
TO DO
TO KNOW

Figure 1.1. An integrated learning module.

where a treatise served to trigger a delighted awareness of a line of inquiry to which he felt compelled to commit himself. Or the problem might derive from the learner's curiosity about an observed disparity between an event encountered in the real world and what he believes he knows about such events. Or the problem might simply be a gift from the teacher which is designed to provide entry into the substance of the body of knowledge he means to teach. Whatever the genesis of the problem, the farmer would likely argue, it is a most convenient way to enter the learning process.

Given the problem, the learner begins a process of reflection, searching for relevancies, pursuing resources that may shed light on the issue, and creating a strategy for an attack on the question. As the strategy develops, possible solutions are formulated for testing and tests are created. Results of those tests are evaluated for their sensibleness, their internal consistency, and their congruence with observations drawn from other realms of experience. Attempts are made to integrate these considerations into the structure of the orthodox subject matter and, in the process, come to know that subject matter in terms of experience—to integrate that collective knowledge into the learner's personal structure of knowing. It is in this active participation—in the *doing*—that the learner comes to *know*, and comes to know in a profound way.

Spoken of here, of course, is "scientific method," an effective process for self-actuating involvement in the act of learning. But, the farmer would maintain, there is more to the process. From a sense of knowing comes a satisfaction of attainment, a delight of understanding, that is not lost in the awareness of a learner. It is from the joy of insight that a positive self-image is born and grows. It generates a sense of power, a self-confidence, that allows curiosity. It is difficult to inquire into unknown areas while clamped in a vise of fear that inquisitiveness will result in failure. It is far easier to rely on established dogmas, walking always in familiar paths, aggressively avoiding questions that may contradict things now known and may lead to new insights. It is the celebration of knowing—an acceptance of this delight of understanding as a legitimate human learning experience—that provides a powerful motivation for learners to learn. The farmer would argue that the sense of personal power, of self-assurance, of positive *being* is an absolutely necessary part of the learning process.

The Teacher

So far the chapter has spoken only of the learning process. But what of the teacher in the enterprise? What is the teacher's role in this scheme of things? Clearly, the farmer would argue, prescriptions for teacher practice are not in order. His own experience suggested that to prescribe and dictate behavior is to stunt creativity, self-actuation, and intellectual independence—those characteristics that are of first order importance in the act of learning. Teaching is not a matter of manipulative technique. It is a matter of individual style and integrity which cannot be taught. These things can only be learned.

In view of the foregoing, the farmer would likely advise only that teachers be authentic in their approach to the enterprise. They must *care* about the process of teaching and learning. They must *care* for their companions in the learning adventure.

They must *become involved* with their students on a human level. Given the prerequisites of authenticity, teachers are free to define questions concerning the art of teaching, design experiments for the classroom, analyze failures, search for insights, delight in successss, develop a sense of individual style and competence, ...

NOTES

1. William D. Pattison, "The Educational Purposes of Geography," in *Evaluation in Geographic Education,* 1971 Yearbook of the National Council for Geographic Education, ed. Dana G. Kurfman (Belmont, Calif.: Fearon Publishers, 1970), pp. 17-26.
2. Adapted from Duane S. Knos, "The Parable of a Literate Farmer," in *Challenge and Change in College Geography,* ed. Nicholas F. Helburn (Boulder, Colo.: Commission on Geographic Education, 1972), pp. 1-3.
3. The author cannot resist the temptation to point out that totaling up of errors is a major criterion for consignment to hell in the God model presented above.

2

On Geography

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What is geography? Is it capes and bays, copra and hay, or capitals, bauxite, and igloos? Is it people and places, wide open spaces, or deserts, mountains, and rivers? Is it latitude/longitude, the human multitude, or Iceland, Greenland, and Asia? Is it migration, diffusion, and water pollution, or glaciers, cultures, and regions? Is it dry continental, things Oriental, or cities, boundaries, and camels?

Teachers, hearing about revolutionary changes in the field, sometimes wonder if what they have been teaching is still part of the discipline as respected by professional geographers, or if some new geography has rendered it obsolete. In the United States, traditional school geography has tended to be regional in its approach—studying regions, places, and peculiarities. Is that now passé, unrespected by professionals and progressive teachers? Certainly the major advances in geography in this generation have been in systematic geography—especially human or cultural, but also physical geography.

During the past quarter century, the discipline of geography has become much more vital in dealing with issues of environmental and social importance in the world. However, during this period while the number of professional geographers—in universities, government, and industry—has increased fourfold, the teaching of geography in public schools has declined markedly. One of the reasons for this paradox is that the newly developed analytical skills of professional geography have not been effectively transmitted to the hand of the teacher.[1]

Hopefully this essay will provide a glimpse of the nature of geography and its expanding utility in viewing the world and analyzing its problems. While this chapter is not intended for professional geographers, who are well aware of the subtleties and complexities of the discipline and who have their own special biases, the author hopes it will aid the teacher.

Background Views on the Nature of Geography

Two hundred years ago Emanuel Kant suggested that there are three basic components to reality: phenomena, time, and space. Time is the chronological order and space is the geometric order in which all phenomena occur.[2] Geographers have long argued that the essence of their discipline, as Kant allowed, is indeed the spatial dimension of this triad as applied to the earth's surface. But it cannot be the spatial dimension alone, for space without substance is geometry. There would be no geography without phenomena and time, and it can be concluded that geography is the study of things distributed on (or near) the earth's surface.

In an article which focuses on the role of geography among the sciences, with special emphasis on regional analysis, Brian Berry proposed a framework for geography that is compatible with the Kantian triad.[3] He begins by making four assumptions about the discipline:

1. Geographers are identified not so much by the phenomena they study, as by the integrating concepts and processes that they stress.
2. The geographic point of view is spatial.
3. The integrating concepts and processes of the geographer relate to spatial arrangements and distributions, to spatial integration, to spatial interactions and organization, and to spatial processes.
4. Geography's integrating concepts and processes concern the worldwide ecosystem of which man is the dominant part.

Building on these assumptions, Berry goes on to propose a framework for geographic study which has three dimensions: places, characteristics, and time (Fig. 2.1). Places are represented by columns in the matrix, while the rows represent various phenomena or characteristics as they might appear from place to place. Analyzing the characteristics of a particular place is akin to the regional approach to geography, or area studies, and would deal with columns in the matrix. Analyzing the distribution of a particular phenomenon or characteristic across places is akin to the topical or systematic approach. Time, the third dimension of the framework, derives from the fact that places and phenomena change; characteristics and distributions are dynamic, not static. Thus places and phenomena are better understood by knowing the processes that have led to the present state.

In another statement, initially prepared for geographic educators but subsequently used by professional geographers, William Pattison has identified four traditions in geographic inquiry.[4] The *spatial tradition* emphasizes locational analysis of phenomena such as cities, industry, and transportation. A recent publication representing this tradition, *The Spatial Organization of Society,* asserts that "space, spatial relations, and change in space—how physical space is structured, how men relate through space, how man has organized his society in space, and how our conception and use of space change—are the core elements of the science of geography."[5]

Increasing development of the spatial view in the last twenty-five years has been welcome because it has led to a stronger theoretical foundation for geography, also allowing for the use of some quantitative tools long neglected by geographers.[6] The

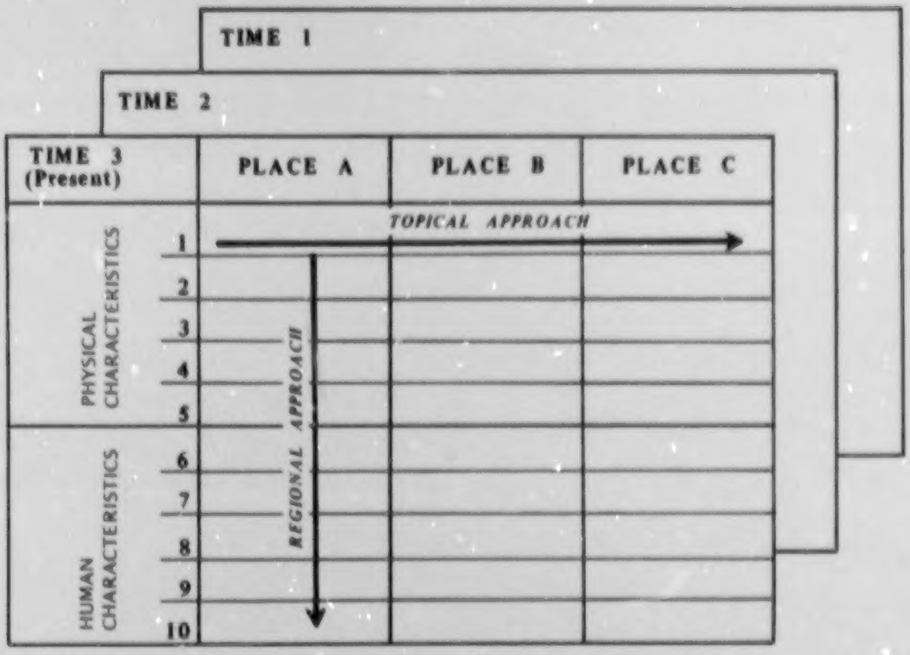

Figure 2.1. Places, characteristics, and time in geographic study. (After Berry)

area studies tradition stresses the characteristics of regions. Practitioners of this tradition "attempt to examine and understand the region as a whole, in all its physical and human aspects, to fit these aspects together, and to relate the region to other regions."[7]

The *man-land tradition* deals with the interactions between people and their environments. "Man-environment relations work in two ways. Man is affected by his environment, but he also has the capacity—indeed, the increasing capacity—to modify that environment."[8] Understanding those relationships is the goal of the man-land tradition in geography.

Finally, the *earth science tradition* embraces the study of elements of the physical environment including climate, soils, landforms, vegetation, and water. The emerging systems approach of this tradition is reflected in the title and preface of a recently published introductory college textbook, *Physical Geography: Earth Systems*.[9] The preface states, "Three basic premises underlie the content and organization of this book: (1) the earth and its environs constitute a single, interconnected system driven primarily by solar energy; (2) change is a natural attribute of a system in which the major inputs of energy vary; and (3) some changes introduced by the human species may be so great as to upset the equilibrium of the entire system." Although physical geography has been considered a part of the earth science tradition, it should be recognized that physical geography is equally linked to life science. Pattison concludes with the reassurance that all four traditions are viable and that they are "joined in action," with the field today pursuing all four of them.[10]

Geography as Science and Humanities

Pattison's four traditions, as he indicates, overlap each other. In this writer's view, it would be simpler to combine man-land and earth science traditions into one heading which might be called environmental (or man-land). Under this heading, the link with life science is more obviously accommodated. The new heading then encompasses all natural environmental studies (physical geography) and all human environmental studies (human geography), as well as those involving the interface between the natural and human realms. The recent work in environmental and hazard perception and adjustment would be included here.[11] The result is three traditions: environmental, spatial, and regional (area studies).

There is a growing number of professionals who feel these traditions are too exclusive, that geographic study which enters into what might be called humanities is not well accommodated. This could include historical geography and what Tuan has called humanistic geography. Other leading geographers whose writings extend outside the three traditions include Lowenthal, Harris, and Meinig.[12] There is a quality permeating the works of such scholars that transcends the scientific objectivity that typifies the spatial and environmental traditions. Quite consciously they avoid the abstraction and fragmentation of reality that is science's means to generalizing, controlling variables, building theories and laws.

The Study of Place

Perhaps the clearest application of this dimension of geography is expressed in the study of place. Understanding a place ultimately depends on experiencing the totality of the place with all its integrated composition, character, and spirit, through all the human senses. An essential part of the understanding derives from the observer's own experience and values. Interpretations and descriptions of a place are necessarily personal and individual. This is beautifully portrayed by Meinig in "The Beholding Eye: Ten Versions of the Same Scene."[13] To allow for this dimension of the field there is need to recognize a fourth tradition—experiential, to borrow a word from Tuan.[14] It follows that every place is intrinsically unique. To analyze, abstract, and generalize as a spatialist might do, takes the process from the humanities to the sciences. Or to isolate and abstract environmental elements, natural or human to explain processes or relationships is a scientific procedure.

It has been asserted by many practitioners in the field that the fundamental purpose in geography is the study of place. Some would say that all traditions, including the four outlined here as environmental, spatial, regional, and experiential, may be subsumed under the place umbrella. Proponents of this view argue that it "logically includes the entire spatial and environmental traditions (understanding places involves thinking about them abstractly and trying to develop as many theories and generalizations about the nature of locations and places and processes involved in their creation and character as we find useful) as well as much more. It allows us to see that geography can be one of the humanities as well as science and it leads toward the kind of regional or place synthesis that if not the ultimate goal is at least one of the major goals of geography."[19]

Place and Region

Place and region are similar in that both refer to a portion of earth-surface space, the criteria and extent of which are defined by the observer. A place, like a region, may be of any size. A place for one purpose might be a building lot, for another a neighborhood, a community, a city, a nation-state, or a continent. There may be places within places—a town within a county, a campground within a park, a meadow within a forest. The same is true of regions. One distinction between the two is that region is typically more abstract. The process of regionalizing is to select criteria on which to define a region, such as the Corn Belt, the Rocky Mountains, or the Central Business District, and then to circumscribe a boundary according to the selected elements, generalizing as necessary. Toward one extreme the region may be essentially holistic, with the investigator attempting to analyze its entirety. Even at this extreme it is abstracted to some degree by the selection of regionalizing criteria and the drawing of its boundaries. Toward the other extreme the region may be derived simply from one element, such as a wind belt or a district of the Federal Reserve Bank.

A place is a totality—the products and processes of nature integrated with the activities and artifacts of man, together with the character, spirit, and quality of the place. It is everything affective as well as cognitive. It is more than a collection of parts; the whole is greater than the sum. Meaning is found in all the elements as well as all the associations and the integrated whole.

The Traditions in Summary

It appears there is room in the field of geography for interests ranging all the way from exacting physical and social science on the one hand to highly interpretive personalization and self-expression on the other. The on-going work by professionals in the field spans this spectrum. Varying mixes of science and humanities are probably represented in most of the work. Teaching represents this range with a mixture of scientific objectivity and rigor mingled with personal subjectivity and values.

Table 2.1 reflects this array. The trouble with tables in this context is that they tend to pigeon-hole, dichotemize, and isolate things from each other where no fixed boundaries exist. At the risk of oversimplifying, however, it might be asserted that environmental studies and spatial studies in geography lie more in the sciences. Pattison's categories are shown in parentheses. The series of expressions listed below, left and right, are also risky to put in print. They are not exclusively the methods of science nor humanities, but represent emphases of each. Science typically involves abstraction, generalization, theory-building, objectivity, quantification, and analytical and cognitive processes. The humanities typically remain more realistic, deal with the particular case, are not principally concerned with theory, are more subjective, generally less quantitative, more synthesizing, and affective in approach. Again, these are not exclusionary. Mixes of any pair may be found on either side.

TABLE 2.1
Four Traditions in Geography

Science			Humanities	
Spatial	**Environmental**		**Regional**	**Experiential**
(Spatial)	(Man-Land)	(Earth Science)	(Area Studies)	
	More abstractive		More realistic	
	More generalizing		More particularizing	
	More theory building		Not so concerned with theory	
	More objective		Typically subjective, interpretive, personal	
	More quantitative		More emphasis on verbal	
	More analytical		More synthesizing	
	More cognitive		More affective	

Environmental, however adequate that term may be, differs from spatial studies depending on the degree of emphasis on sustantive versus geometric concerns, respectively. Under environmental are the systematic physical and systematic cultural or human geographies that typify the field as it deals with natural environmental systems—geomorphic, climatic, hydrologic, soils, and vegetation—and human environmental systems—economic, social, urban, political, and so on. Grouping them under a common heading also portrays the free interaction between the two realms that is reflected in so much geographic research and teaching. Recent public interest in things environmental has stimulated a resurgence in physical geography applied to resource management and in perception studies related to both natural and human environments.

The spatial emphasis, which has blossomed in the past twenty-five years, has been espoused particularly by human geographers. It is particularly effective in sharpening urban, transportation, and economic studies, and in location analysis. There can be no question that the concomitant quantitative revolution and spatial analysis of the 1950s and 1960s have greatly enhanced the science of geography and enlarged its applicability in the practical world of government and industry.

Regional or area studies date from antiquity, reaching a peak of dominance in the 1930s and 1940s. They have ranged from local areas examined in great detail to global patterns, continents, and countries. Typically they appear as an orderly survey of the elements of the region, natural and human. During the past quarter century when spatial analysis and systematic geography have grown in skills and prominence, regional studies have lagged in enrollments, interest, and application. Regional studies are much more difficult to apply quantitive and spatial skills to in that they are so much more complex, especially the more holistic they are. Regional studies are both scientific and humanistic, but the nearer they come to holism, the more humanistic they tend to be.

Experiential geography is essentially humanistic. Although perhaps best expressed in the study of place, there may be an element of the experiential in all geographic studies. Development of the experiential/humanistic tradition may not contribute so directly to production and growth in the discipline during this age of science, pragmatism, and application in environmental planning, but it introduces an element of quality in appreciation of life and landscape that is long overdue, and promises to enrich academic geography as well.

Teaching Geography and Science and Humanities

Geography has many dimensions, perhaps so many that the teacher may be reassured that almost anything is acceptable under the banner of geography in the schools. While that may be true in terms of the number of topics that may be discussed, the issue of conceptual relationships remains. One of the underlying problems is that geography is not subject matter specific. Taking license from this, under the aegis of the area studies tradition or regional geography, teachers and textbook writers have difficulty resisting the temptation to inventory endless lists of products, customs, place names, physical features, and other detail for each region or country discussed. The area studies tradition has been so weakened and branded by such compendia, without adequate conceptual structure or attempts at explanation of the various distributions, that spatialists and other systematic geographers have tended to eschew this tradition. Actually, the area tradition is still viable, as Pattison reassures, but the compendium or encyclopedic treatment as a basic diet has no place in curriculum. It is uninspiring and sterile. Memorizing lists of place names and facts is no more the purpose of geography than memorizing the times tables is the purpose of mathematics.

To overcome the sterility and stigma of encyclopedic regional geography the HSGP organized its curricula along systematic or topical lines, dealing with current research areas in professional geography—urban, industrial, agricultural, cultural, and political. This shift in subject matter was a lot to ask of teachers. It was compounded by a second and concurrent shift in teaching strategy—from the didactic or expository to inquiry. As creditable as the program is in terms of both matter and method, there remain the nagging feelings that a secondary school geography program ought to have more of a global focus than the dominantly North American examples in HSGP. Probably what is needed today is a geography curriculum that is global/regional in content and inquiry-oriented in strategy, with appropriate environmental, spatial, and experiential dimensions built in.[16]

Such an outline could allow a variety of problems and activities espousing all four traditions. Liberal amounts of physical geography, human geography, perception studies, spatial analysis, and humanism can be carefully structured into various regional investigations of the world.

The remainder of this essay establishes a framework for geographic inquiry. Although the headings spatial pattern and spatial process have come to be associated with the spatial view, they derive from basic notions as old as the field of geography—that geography is the study of distributions and interrelationships on the earth. Whatever the labels, these ideas apply to physical geography, human geography, spatial analysis, and regional geography. As emphasized, humanistic treatment of places and phenomena is likewise valuable, but it cannot be stratified so analytically.

Spatial Patterns, Spatial Processes, and Regions

One thing that interests a geographer is the occurrence of a phenomenon at a place in a way that is different from the way it appears elsewhere. Understanding this spatial variation and organization of phenomena on the earth becomes the substance of much geographic inquiry, which in its simplest form comes down to a study of *spatial patterns* and *spatial processes*.[17]

The study of spatial patterns and processes has been a major methodological basis for geographic inquiry throughout the development of the discipline—including the four traditions identified earlier. Through most of that history a description of patterns has been dominant, but since about 1950 the search for explanation of the patterns has led to an increasing preoccupation with process. The study of pattern and process combined in various ways provides the basis for other concepts in geography, including site and situation, diffusion, areal differentiation, and region.

From the spatial and the environmental (man-land) points of view, the purpose of geography is to describe and explain (and perhaps predict) the spatial patterns and spatial processes of phenomena on the earth.[18]

Maps, Scale, and Photos

Before turning to a discussion of patterns, processes, and regions, let us briefly discuss the nature of maps and scale inasmuch as they are basic to all geographic inquiry. Maps, or cartographics, are to geography as graphics are to science in general.[19] The distinctive quality of cartography, apart from other graphic forms, is the spatial dimension, as maps portray spatial distributions and relationships at or near the earth's surface.

If a picture is worth a thousand words, the same may be said of a map. It is a form of geographic visual shorthand that summarizes spatial information, sometimes of a very complex nature, in relatively simple form. In fact, there is no substitute for the map, for there are certain spatial forms and relationships that no number of words can convey. Try to imagine, for example, describing accurately the distribution of population of a country or the coastal outline and shape of Europe without the use of maps.

Maps are, of course, generalizations of reality. The cartographer generalizes or edits reality in two ways: (1) he selects certain phenomena from all the phenomena that occur, and (2) he selects a scale at which to portray the phenomena, thus placing certain limits on the style and detail of cartographic presentation.

Scale has two quite different meanings in geography. One refers to the extent of the area of study, ranging from global to local. In this context geographers sometimes use the expressions macro-scale, suggesting a large area of observation, or micro-scale, meaning a small study area where greater detail may be examined. This kind of scale has sometimes been called "geographic scale." The other meaning of scale has to do with the ratio of the size of the map to the area mapped. A small-scale map is one in which the size of the map is very small compared to the area or region mapped. A map of the world, for example, would normally be a small-scale map, perhaps with a ratio of 1:10,000,000—meaning that any distance between two places on the map is only one ten-millionth that distance between those two places on the earth. A large-scale map would have a larger ratio of map size to the area represented. A typical U.S. Geological Survey quadrangle at 1:24,000 is a large-scale map. It covers only a small area with large amount of detail. The two uses of the term scale have somewhat a reciprocal meaning: a large-study area would need to be mapped at small scale, while a small-study area might be mapped at large scale, allowing, if the cartographer so chooses, the representation of great detail.

Aerial photography and remote sensing, like maps, are of special significance to geographic teaching and research. Vertical aerial photography is like a map in that all objects appearing on the photograph are in proper spatial order, except for some displacement of features outward or inward with respect to the center due to relief variation. With most satellite imagery, the altitude of the camera or sensor is so high that displacement due to relief is insignificant. Both aerial photography and satellite imagery are vital tools for geographic inquiry and exciting, tangible instruments in the hands of students at almost any level. Data telemetered from orbiting satellites in digital form or returned in photographic form provide a rich new source of information about the earth and its resources. Students benefit substantially from the use of remote sensing imagery because it gives them a new look at the earth and its surface features, which they may have only seen symbolized on maps heretofore.[20]

The discussion now turns to spatial pattern, spatial process, and region as a methodological framework for geographic study. It will be evident through the discussion that the map is a basic tool in the hand of the investigator, and that the matter of scales of observation and mapping is continuously germane.

Spatial Pattern

No spatial arrangement of phenomena is static. The distinction between spatial pattern and spatial process is that the former refers to the structure of a phenomenon at a given moment in time while the latter refers to the nature and rate of change in that structure, together with the forces that cause the change. For geographers, the pattern of a spatially distributed phenomenon is the spatial arrangement of that phenomenon across the area of study, and includes such characteristics as density, dispersion, agglomeration, uniformity, linearity, and magnitude. They may speak of the patterns of rainfall, vegetation, drainage systems, population distribution, and so on. In each case the descriptors of the pattern will include such qualities as those just mentioned. Increasingly geographers are utilizing mathematical and statistical procedures to better describe the patterns.[21]

Normally geographers are concerned with distributions and patterns of things at or near the earth's surface; and the map, typically a flat surface, constrains them to represent the phenomena as if they were two-dimensional. Since much of what is dealt with is three-dimensional, such as terrain, river systems, or urban structures, and since some objects lie above the surface, such as wind systems, or below the surface, such as underground mines, ways have been found to symbolize three-dimensional objects on flat maps.

Location. Location is a spatial reference system and is a necessary part of spatial patterns. By locating the position of things in the world and on the map, their spatial patterns emerge. "In geography the first order of business is to fix accurately the locations of the elements of a distribution."[22] Some phenomena, such as terrain, are continuous in their distribution; others, such as cities or oil wells, are interrupted and discontinuous. The first step in any case is to identify and map the location of the elements of the distribution.

Points, lines, and areas can all be shown on maps by using appropriate symbols. As the map scale changes the choice of symbols may also change. For example, on a small-scale map of the United States, Washington, D.C. may appear as a dot or point, simply signifying its location. As scale increases, the city may take up an area on the map, and portions of the city may be shown; in this case, the Lincoln Memorial might show as a point location. As detail increases with still larger scale, the Memorial may be shown accurately as a rectangle representing the structure occupying a specified area of space, rather than as just a symbolic point of position.

Location may be identified in several ways. We may speak of the location of St. Louis at 39°N latitude and 90°W longitude or the Gateway Arch at Memorial Drive and Market Street. In both cases the location is established by a "grid" or network of fixed lines, imaginary or real. The location of St. Louis may also be identified as being 900 kilometers north of New Orleans, or more precisely, as lying on compass bearing 359°, 960 kilometers from New Orleans. This is the "polar coordinate" method of locating a place with reference to some other known point.

Discovering and mapping the location of places was the main role of geography for two thousand years. Since about 1950 relative location has taken on new dimensions for geographers. For example, distance may be expressed in terms of driving time or flying time, rather than miles or kilometers. People may even speak of the "shortening" of distance through technological innovation. Everyone "knows" that London is "closer" than it used to be (unless you're at the London airport, in which case the friction of congestion may increase the distance to town in terms of time). Relative location has become an exciting dimension of geography, even extending into the psychological realm, where many geographers are involved in the investigation of cognitive or mental maps. The perception of distance and spatial patterns may be as important as the actual distance and patterns measured on the earth and scaled on the map.[23]

Areal association. Spatial patterns may be observed for a single phenomenon or for more than one. The distribution of population, for example, may be mapped and described in terms of density, dispersion, agglomeration, and so on. A great deal of information may be obtained from examining a map of a single distribution, and it can be a rewarding classroom exercise to pursue such a course. Seldom, however, do geographers or teachers examine and describe a single distribution for its own sake. Usually, the analysis of one pattern has meaning only when it is compared with some other distribution pattern. What value would the analysis of a population map have, with all its variable characteristics, if not related to patterns of terrain, rivers, coastlines, farmlands, or other features.[24]

Areal association is the degree to which two or more phenomena co-vary in their patterns of distribution. If a map of rainfall closely resembles a map of vegetation, for example, the two have a high degree of areal association. A high degree of areal association between two distributions often indicates some kind of relationship between the two features. We must be careful, however, that we do not automatically ascribe a direct causal relationship between two co-varying patterns. For example, we may find that states with high crime rates also have high teachers' salaries. The two distributions may be similar in form, but to assume one is a result of the other may be erroneous. The relationship between two similar patterns of distribution may be generic or genetic. That is, it may be a relationship of form only, or there may be a causal relationship in function. Analysis of areal association thus involves examination at two levels, the first in form, the second in function. The first involves spatial pattern only, the second invokes spatial processes.

Teachers may benefit from a brief discussion of this important distinction. The following example will also serve as the transition into the section on spatial process. Consider two maps with similar patterns—one of corn production, the other of hog production. By simply looking at the two maps you can see that in fact they *do* resemble one another. You may even visually superimpose one on the other and observe a close fit. You are observing an areal association in *form*, or pattern, only. There is no explanation as to why they co-vary; they just do.

Geographers may show this pattern of close areal association in two ways: through maps and through various graphic/statistical devices, such as scatter diagrams. Figure 2.2 shows on the left the close areal association between the production of corn and hogs. In fact the two maps have been superimposed into one in order to show the close fit. Counties with a high production of one have a high production of the other. The scatter diagram shows the same co-variation, but in graphic form. The geographic, or

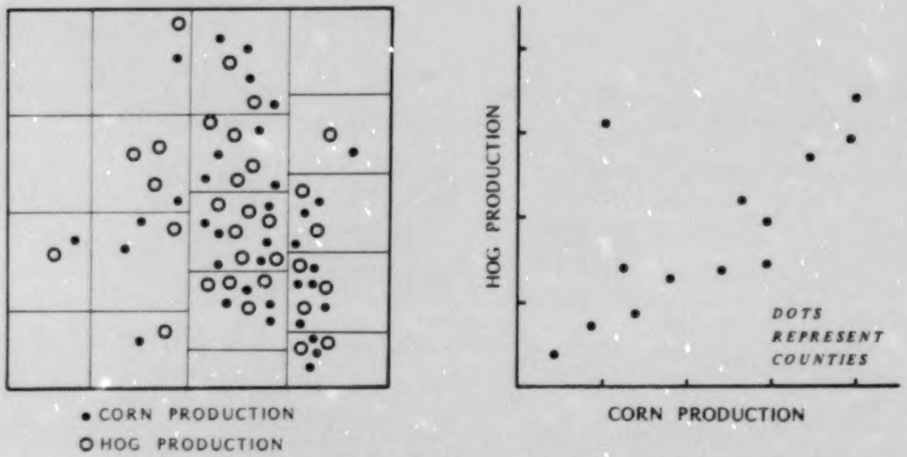

Figure 2.2. Map and scatter diagram representing corn and hog production by county.

spatial, perspective is implied in the scatter diagram, as the points on the graph represent individual counties which are particular places. The scatter diagram shows the same positive relationship the map shows—the greater the production of corn, the greater the production of hogs in general, county by county. One advantage of the scatter diagram over the map of the same data is that anomalies are easily seen. For example, it can be seen in the scatter diagram of Figure 2.2 that one particular county has high hog production with low corn production. This situation begs the question, Why? What is different about that county? For that matter, why is there a general positive correlation between corn and hog production? The answer to these questions requires an analysis of spatial process. The same is true of any explanation in geography. One cannot answer *why* questions by looking at spatial patterns alone, even co-varying patterns such as corn and hogs.

Spatial Processes

No matter how close the areal association of hogs and corn production, as shown on maps or in statistical comparison, a process that links the two must be identified in order to establish causality, or genetic areal association. To find this functional linkage requires some "ground truth." Map patterns and statistics are not enough. One must go to the place or to some other source and search for a cause or process that functionally links the two phenomena. It may then be observed that corn is a major constituent in the diet of a hog and that shipping the corn to other places where hogs might be fed may not be feasible, for a variety of reasons.

It appears that explanation in geography is basically a two-step procedure: The first step is to examine spatial patterns of two or more phenomena in order to identify a generic areal association since the cause of a distribution can never be found in its own pattern alone. The second is to search for a process, a kind of "ground truth," that functionally links the one distribution to the other, i.e., a genetic areal association, and thus explains the distribution or pattern.[25] Hence, geographers may speak of areal association in form and areal association in function. Sometimes they are tempted to be content with the first step, assuming that a close association in form must be because of a functional tie. Teachers and researchers must guard against this potential pitfall. Otherwise, our knowledge might be little better than "folk knowledge."[26]

Sometimes the ground truth is more difficult to identify than hogs consuming corn, and so ways have been devised of making statements of probability, e.g., there is a 95 percent probability that the pattern of y is caused by the distribution of x. In other words, there is only a 5 percent chance that pattern y could have occurred independently from pattern x, i.e., that the two patterns co-vary just by chance and coincidence. Generally, we must resort more to statements of probability where human factors are involved than for natural distributions.

Certain relationships may be negative rather than positive. For example, with increasing distance from the city center, land values decrease. A map and a graph of this areal association may appear as in Figure 2.3. The reason for this negative, or inverse, relationship is, as Murphy suggests, that "Modern Western cities are . . . primarily commercial phenomena, and their internal spatial patterns and forms are shaped to a major extent by their commercial/industrial functions and by the commercial value of

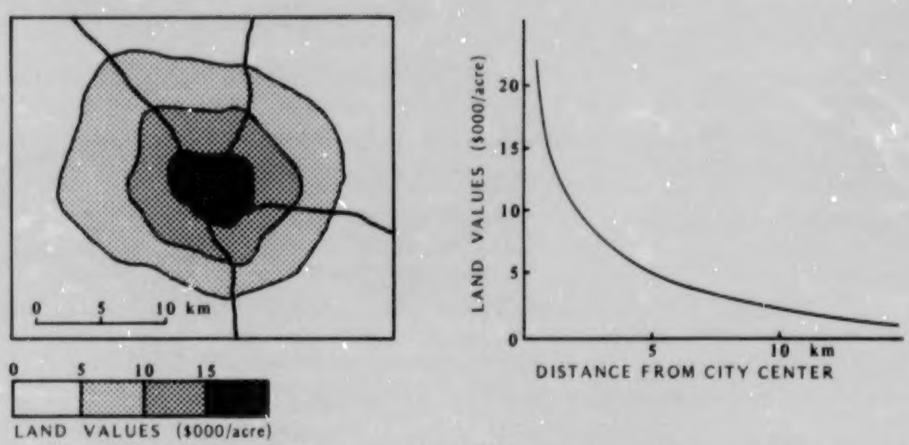

Figure 2.3. Inverse relationship between land value and distance from city center.

urban land."[27] The greater values near the center reflect the propensity of business to gravitate toward a central location.

Whether spatial relationships are positive or negative, the above illustrations demonstrate the intertwining of spatial patterns, or form, and spatial processes, or function, in geographic inquiry. Whereas spatial pattern represents the structure of geographic phenomena, spatial process represents the functional relationships.

The significance of spatial process has become especially evident in the twentieth century. Vast amounts of energy and time are expended shuttling people, material, and information from place to place. Geographers have become increasingly involved in the analysis of these processes and the patterns that result.

Some spatial processes are rapid and some occur more slowly, but all take time: from the passage of a tornado to the erosion of a canyon, from a telephone call to the spread of a tradition. Some processes are cyclical, while others appear to be one-way. Three kinds of spatial processes and the resulting patterns—circulation, diffusion, and rates of change—will be examined next. Geographers are involved in the investigation of all three.[28]

Circulation. Circulation refers to a system or pattern of movement, either natural, man-induced, or both, that is usually somewhat cyclical. A circulation system may be regarded as an open system with at least some of the driving energy being introduced from outside the system itself. Some common natural circulations and then the human circulations of transportation and communication will be identified.[29]

Natural circulations of concern to geographers include air circulation or wind patterns at global, regional, and local scales; water circulation as in the water cycle or in standing water such as the ocean; and geomorphic systems. To geographers the fluids of air and water are of interest in their own right as natural systems to understand, map, and explain, as well as in the context of human environments in various roles, such as carriers of man, his goods, and his wastes. One may visualize the global wind pattern, for example, and contemplate its shifting cycles and resulting seasonal and environmental changes, or one may visualize the influence of the wind on people and the ways they use it and abuse it as a waste disposal system. One may also think of ocean circulation, its influence on climate and natural environments, and its use or abuse by man. Geomorphic processes of erosion and deposition, which may appear to be one-way rather than cyclical in the human time frame, are of concern to geographers in their own right, or as agents people must interface with as they build their structures on the land.

Transportation of goods, services, and people is also an interaction of man and nature. Nature, of course, has its own transportation systems, but man has invented many of his own by taking advantage of natural systems and energies. Transportation networks are systems or patterns of nodes and linkages, representing points of origin, lines of movement, and points of destination. Complementarity is an important ingredient in the movement of goods, services, and people. To induce movement, two different places must represent, respectively, a source of supply and a place of need. If costs or the friction of distance are not too great, the movement takes place and a transportation system has begun. Transportation geographers, dealing with a wide range of theoretical and practical problems, are advancing the spatial tradition of geography to a remarkable degree.[30]

Communication may be considered the circulation of information and ideas. The system of transmission may range from word-of-mouth to electronic/optical mechanisms involving satellites. In each case a spatial pattern evolves. Geographers may, for example, be interested in newspaper circulation patterns or telephone networks in order to understand the distribution of services, social and behavioral patterns, growth trends, and so forth. Social interaction is an important system of communication at the micro-scale of the neighborhood, but decreases in relative effectiveness with expanding scales of community and city as distance and social stratification intervene.[31] Telephone systems, postal systems, and mass media are relatively more important at the broader scales of region, nation, and the world. Within an urban society there are many cycles of transportation such as the daily trip to work or school, the weekly trip to the grocery store or to church, or the annual family vacation. These simultaneous cycles which their institutions tend to impose upon people have been called "cicadian" rhythms, suggesting that people move about in cycles of unison somewhat as cicadas sound off in rhythmic concert.[32] Transportation and communication systems seem to have "conspired" to draw us into certain patterns of activity in time and space. School systems are an example of a communication network with sharply defined spatial boundaries and time periods of operation that reinforce cicadian rhythms for the family in daily and weekly cycles, even prescribing family vacation time.

A pattern of trade areas around cities develops in response to the dynamics of transportation and communications networks. Each network is a kind of subsystem within a larger system of a city's sphere of influence. A hierarchy of cities induces a series of trade areas at ascending levels from small towns to large cities, with the trade areas of the larger centers completely overlapping the trade areas of surrounding satellite towns.[33]

Spatial diffusion. Diffusion is distinct from circulation in that it is typically one-way, as opposed to cyclical, and it is typically one-time. Diffusion involves the spread of phenomena across space over time. The spread of phenomena is accomplished by what Peter Gould calls the carriers.[34] Gould identifies four types, or carriers, of diffusion. *Expansion diffusion* involves the spread of an idea, such as a new farming innovation or a rumor, wherein the total number of knowers increases through time.

Relocation diffusion is accomplished by the movement of carriers themselves. The most common example is human migration, a spatial process going on at many scales at all times. Typical examples include the post-World War II movement from rural to urban residence, the movement from city center to suburb, the migration from East to West in the United States, and the migration of black Americans from the South to northern and western cities.

Contagious diffusion is exemplified by the spread of disease. The often-cited example of cholera, which in 1849 was introduced into the United States at two point sources, is shown in Figure 2.4. The flow lines and dates dramatize the dynamics of space-time interaction.

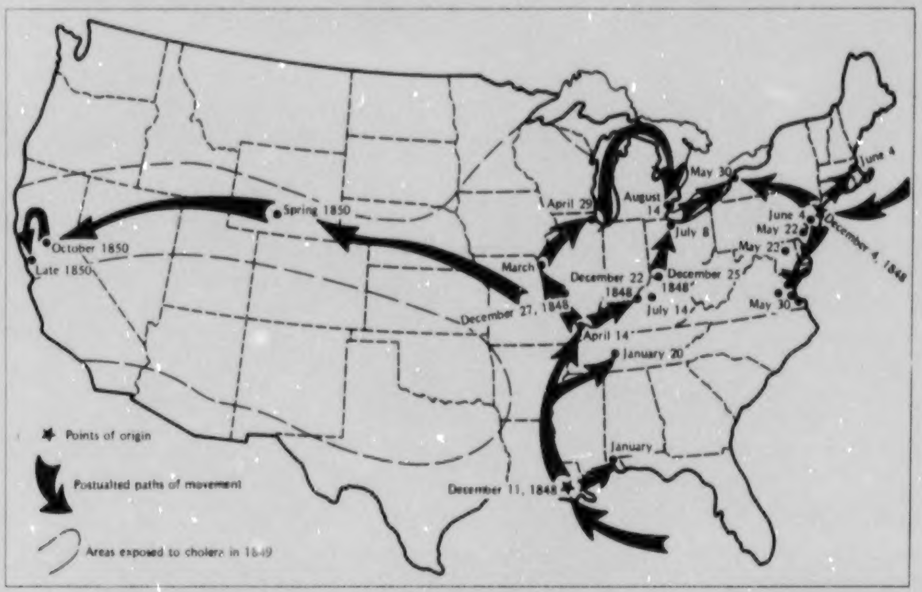
Spring 1850
October 1850
Late 1850
April 29
August 14
May 30
June 4
July 8
June 4
May 22
May 22
December 4, 1848
March
December 22 1848
December 25 1848
December 27, 1848
July 14
May 30
April 14
January 20
January
December 11, 1848
Points of origin
Postulated paths of movement
Areas exposed to cholera in 1849

Figure 2.4. Diffusion of cholera in the United States in 1849. (After G. F. Pyle, "Diffusion of Cholera in the U.S. in the 19th Century," *Geographical Analysis*, vol. 1, 1969)

The fourth type of diffusion in this classification is *hierarchical diffusion.* It is illustrated by the spread of news or fashions to major urban centers first, jumping across vast spaces, even continents and oceans, before filtering down to lower and lower levels in the hierarchy of urban systems to the smallest towns and villages.

A diffusion lag may be spoken of as it affects a smaller, more isolated place, even though it may be closer to the source than a larger place favored by more efficient transportation and communication systems. The river boats carrying cholera up the Mississippi must have passed by dozens of small settlements en route to major ports of call upstream. Similar leap-frogging occurs with fashions and other innovations.

Obviously, the four types of diffusion are not mutually exclusive. Expansion, relocation, or contagious diffusion are often hierarchical, either upward or downward through the hierarchy. However, with the more effective communication/transportation systems linking larger urban centers, diffusion is commonly downward from such centers. Migration from farm to city is an example of upward movement in the hierarchy. Although human migrations are often in response to duress, movement may take place either from "push" factors or from "pull" factors, where it is the attraction of the new place that provides the initiative to relocate, or from both. Spatial processes and resulting patterns are evident in either case.

Classroom discussions citing various examples of the four types of diffusion at various scales and rates could lead to a stronger grasp of time-space phenomena interaction, and ways in which spatial patterns change over time *because* of spatial processes. An open-ended discussion of the many carriers and barriers that may be identified locally and their influence on the patterns and changes in the community and region could generate a vivid lesson on geography.[33]

Urbanization is one of the more dramatic spatial diffusion processes operating in the North American landscape today. Students living in an urban world may be inclined to take their city environments as given, without much thought of the origins, the patterns of growth, or the spatial expansion that may still be underway. Growth may continue in response to many factors. It would be well for students to pause and contemplate the point of origin and the patterns and causes of growth of their home town, as prologue to the current dynamic situation. The class might ask whether the forces (spatial processes) creating the growth are still operating, whether growth is continuing and, if so, in which directions, and what land uses are likely to be sacrificed as expansion continues—what new patterns will emerge.[34]

Spatial diffusion also occurs in natural systems. Smoke from a forest fire, dust from a wind storm, fog spreading across a bay, and other diffusion processes occur without the presence of people. However, people may introduce new sources of "contamination" to the natural systems, often overloading them beyond their capacity to diffuse and dilute the foreign matter. Water, air, and land systems, in many places burdened beyond their natural threshold for diffusion, exhibit stresses we call pollution.[35]

Diffusion in both natural and human systems tends to level out differences in the environment through the flow of energy and matter from sources to sinks. Occasionally, things happen to reduce, interrupt, or reverse this flow. People are often such a cause. However, there is some tendency toward uniformity of social systems through the interactions of peoples. The HSGP activity "Culture Change: A Trend Toward Uniformity" (Unit 3) depicts the emerging similarity of cities at many places around the world as cultures intermesh. While there is a trend toward uniformity at a level where economic amenities are exchanged across international boundaries, and that uniformity is especially well expressed in cities (both in form and function), inequities continue beneath that level. Further, at a national scale, spatial diffusion of amenities is still ineffective as rich nations trade among themselves and "the gap between the 'developed' and 'developing' sectors continues to widen."[18]

Rates of change. Neither circulation nor diffusion processes continue at a constant rate. Within human systems, technology has a remarkable impact on changing rates of circulation. Consider, for instance, the effect of new forms of transportation on the movement of goods and people through the years. But the rates vary at different scales. Long distance travel may accelerate rapidly with the use of jet airliners while local traffic is impeded by urban congestion. A multiplicity of forces is operating at all scales affecting rates of change in circulation. To complicate matters more, while the rates of circulation change, the pattern of the circulation system generally changes concurrently—another complex interaction of spatial pattern and spatial process.

Diffusion rates also change. Gould suggests that new ideas or innovations are accepted slowly at first as only a few people adopt the notion (Fig. 2.5). Once adopted by a few early "innovators," the rate of spread increases and then tapers off with the remaining "laggards."

An example from India shows changing rates of communication and diffusion concurrently. In the remote villages, Indian peasant life has changed little for hundreds of years. Communications were so poor that many isolated villagers were unaware that there was an India. As the supply of transistor radios expanded and prices came down, the devices began to filter into the villages. Within a very short time, following centuries of near zero communication, the world suddenly came to the Indian villager—at least in part.

Regarding natural systems, change in rates of circulation and diffusion is also con-

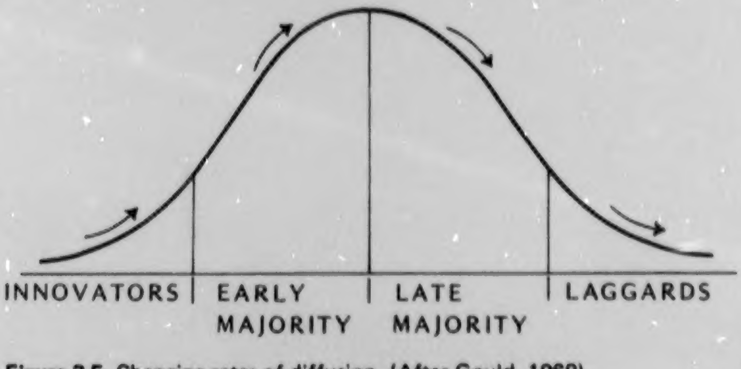

Figure 2.5. Changing rates of diffusion. (After Gould, 1969)

tinuous. Wind speeds wax and wane, stream flows change with seasons, and with changing rates come changing positions of systems to varying degrees. Mean rates of movement may be determined within specific systems. Superimposed on these rates are the increments of change. This increment of change in process rates might also be applied to human systems and man/environment systems, although little has been done to explore these frontiers.

Regions and Regionalizing

As indicated earlier, a region is a portion of earth-surface space. Geographers delineate a region by looking at spatial patterns and/or spatial processes in an area. In other words, the identification of a region is simply the application of those two concepts. Conversely, when they are identifying a spatial pattern or process for a given phenomenon, natural or human, they are necessarily regionalizing, i.e., outlining drainage basins, climatic patterns, or urban areas. In the broadest and most traditional sense, regional studies are typically holistic, encompassing "all" the natural and human systems of a portion of the earth. On the other hand, systematic studies in geography usually focus on a phenomenon such as climate, terrain, or soil systems in the natural realm, or on such things as urban, political, or economic systems in the human realm. The old dichotomy between regional and systematic geography is thus only a difference in emphasis; both deal with regions and both deal with systems.[39]

As an event is to history, a segment from the continuum of time, so a region is to geography, a segment from the spatial continuum of the earth's surface. Regions do not exist *a priori*. Rather, they are constructs imposed on reality by the observer. What is recognized as a region depends on the purpose and criteria of the observer. The spatial continuum, like the historical continuum, can be segmented in many different ways and there is no "best" set of regions for every purpose.

Recognizing that no two places on earth are quite alike, it became a popular task to delineate the earth into various regions and to identify the characteristics which distinguish one region from another—a process that became known as *areal differentiation*. To many geographers this was the essence of the discipline.[40] Unfortunately, as the encyclopedic tendency grew, under the area studies tradition, the concept of the region and the process of regionalizing became obscure to the student. Students ought to have an opportunity to regionalize for themselves, as it is one of the most fundamental tasks of the geographer.

Regionalizing is the process of delineating regions. It is a form of classification.[41] Whatever the type of region, the geographer segregates a portion of earth-surface space, its patterns and/or processes, for study. Regions need not be holistic. One investigator may seek to delineate culture regions, another agricultural regions or vegetation regions. In each case, ". . . the geographer's object is to minimize the internal variation within a region and to maximize its variation with respect to other regions."[42]

Geographers speak of two types of regions: uniform and functional (nodal). A *uniform region* is a portion of earth-surface space with a high degree of homogeneity within—such as the Corn Belt, the Selvas, or downtown—and quite different from surrounding landscapes on the basis of the criteria selected. The boundary is arbitrary and may be transitional or sharp. The limit of the Corn Belt is not distinct, the margin of the Selvas fades into surrounding regions, and downtown grades into adjacent land uses. Uniform regions may be drawn on the basis of single factors, such as agriculture, vegetation, or land use. Or they may be drawn on the basis of multiple criteria. For example, Figure 2.6 identifies great regional differences in development of the countries of the world by compositing, with the aid of the computer, 43 economic and social indicators.

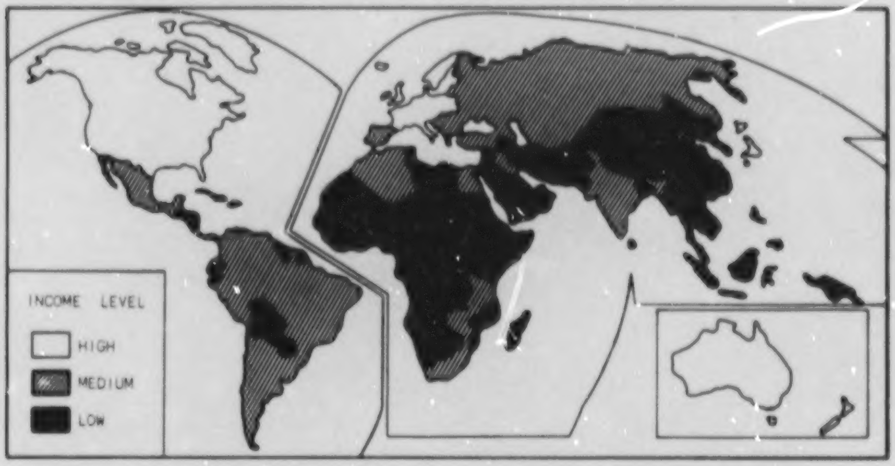

Figure 2.6. World economic regions—an example of uniform regions. (After Norton Ginsburg, *Atlas of Economic Development,* University of Chicago Press, 1961)

A *functional region* is based on dynamic criteria, emphasizing motion, or connections and nodes. For example, a Chicago region might be defined as the area covered by Chicago and the "satellite" cities and towns that are closely tied to Chicago—economically, politically, and functionally. Again, the limits and boundaries of the region are arbitrary. In fact, little attention is given to boundaries, with greater emphasis on internal dynamics. The study of cities as "central places" serving hinterlands of varying size with varying functions is an application of the functional region concept. Such regions are often overlapping, as shown in Figure 2.7. Other examples of functional regions include "concentric" rings around the city representing commuting time, or origin and destination lines radiating from the CBD, or, in the physical world, a river basin. Typically, a functional region involves vector quantities while a uniform region involves scalar quantities, although it is clear that they may be intermingled.

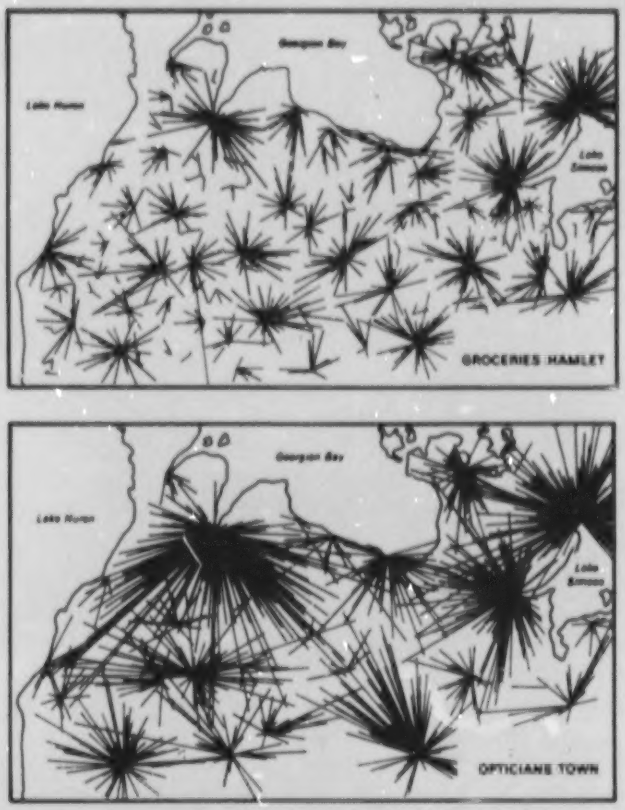

Figure 2.7. Patterns of food shopping (above) and patterns of travel for optical service (below) in southern Georgian Bay area, 1966. (After R. S. Thoman and M. H. Yeates, *Delimitation of Development Regions in Canada: with Special Attention to the Georgian Bay Area,* Area Development Agency, Department of Industry, Canada, 1966)

A region may have characteristics of both uniform and functional quality. Fielding points out that: "A city is both a uniform region and the center of a nodal [functional] region. As an association of intensive land utilization, it can be differentiated as a uniform region from the less intensive land utilization of the surrounding rural areas. However, there are many interconnections between the urban and surrounding rural areas. Newspapers, banks, and administrative offices in the city serve the rural community so that the urban area is also the center of a nodal region."[41]

A culture region may also reflect both qualities. For example, Figure 2.8 shows a spatial pattern of uniform regions representing degrees of dominance by a particular

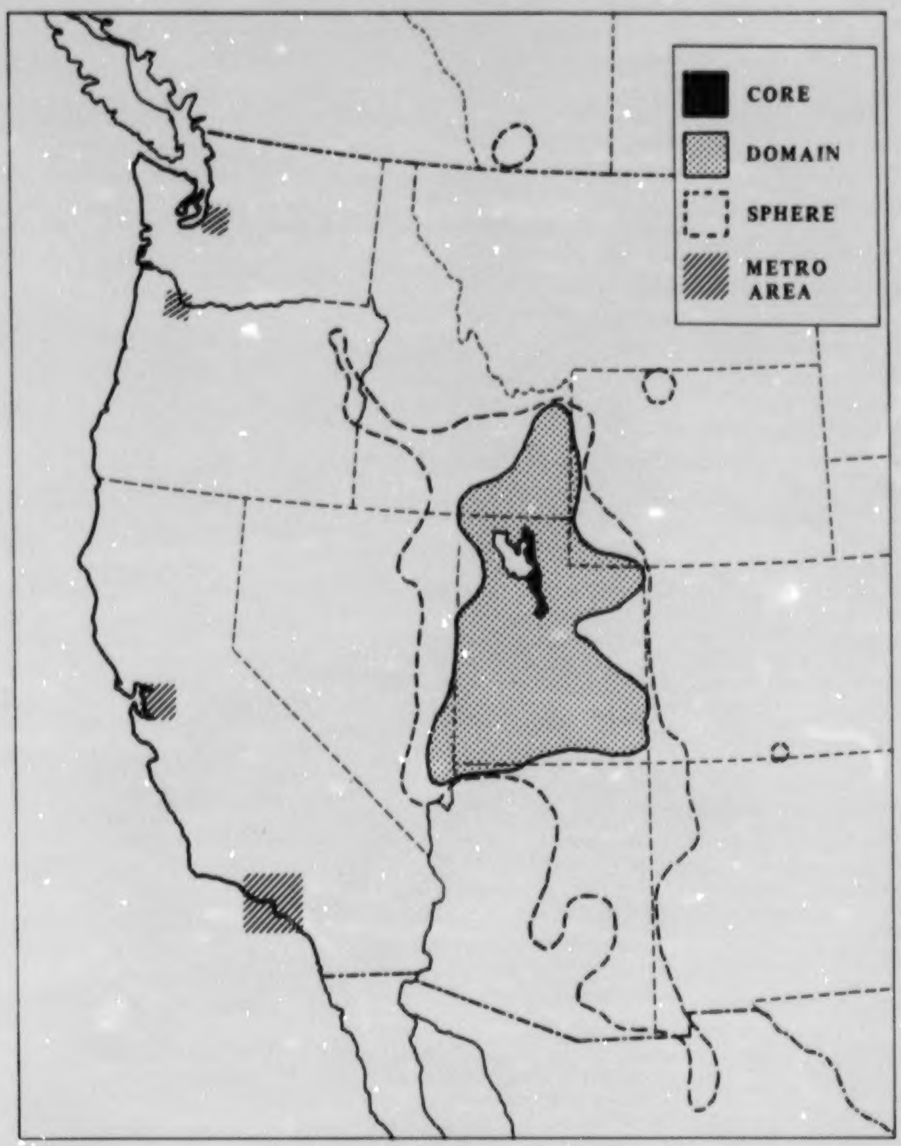

Figure 2.8. Mormon culture regions, illustrating the interrelation of uniform and functional phenomena. (After Donald W. Meinig, "The Mormon Culture Region: Strategies and Patterns in the Geography of the American West, 1847-1964," *Annals of the Association of American Geographers,* vol. 55, June 1965)

culture. The zones are based on scalar quantities such as percentages of population. It is clear that this pattern is produced by a spatial process, a diffusion of influence moving outward from the core. This illustration demonstrates some important interrelationships. First is the interrelationship between spatial pattern and spatial process, specifically that spatial patterns are *produced by* spatial processes and represent the structure of the phenomena at a given point in time. Second is the general correlation between spatial patterns and uniform regions on the one hand, and between spatial processes and functional regions on the other. Third is that regionalizing is basically the application of spatial pattern and spatial process, which are the backbone of geographic inquiry among the sciences.

The preceding discussion on regions is essentially a spatial analysis in point of view. The other major component of regional study involves synthesizing and humanizing to obtain fuller understanding of the region. Concluding with this particular example of culture regions provides a basis for citing the importance of humanities in geographic study. It was part of the author's objective to interpret the historical foundation of the culture region to better understand the processes, patterns, and integrated meaning of the landscape. Closing on this point provides a demonstration of the delicate blend of geography as science and humanities.

Conclusion

The debate over the nature of geography is long and complex. For simplicity four traditions have been identified: environmental, spatial, regional, and experiential. Each overlaps the other in practice and all are vital in modern geography. The effective school curriculum would find value in encompassing, or exploring, all four. Students would benefit from experience in each tradition as well as in the techniques of map interpretation, aerial photo interpretation, remote sensing, and some quantification. The section on Spatial Patterns, Spatial Processes, and Regions offers some operational examples and conceptual applications in human and physical geography that should be helpful to the teacher. Finally, a discussion of regions discloses the value of considering geography among both the sciences and the humanities.

NOTES

1. One notable effort in this regard is the High School Geography Project (HSGP), in which dozens of professional geographers interacted with high school teachers and educational psychologists to produce a curriculum that better represents modern geography. See *Geography in an Urban Age* (New York: Macmillan Co., 1969). A parallel effort, the Earth Science Curriculum Project (ESCP), involved many physical geographers in its development. The two curricula complement each other very well in a school program, with HSGP espousing principally human geography, with some physical geography materials involved, and ESCP encompassing physical geography as it relates to other earth sciences. See *Investigating the Earth* (Boston: Houghton Mifflin Co., 1967). One of the problems is that the geography teacher rarely teaches earth science, ESCP or otherwise. Consequently the schism between the human and physical emphasis is perpetuated.

2. For a detailed review of Kant's views on geography, see J. A. May, *Kant's Concept of Geography and Its Relation to Recent Geographic Thought* (Toronto: University of Toronto Press, 1974).
3. Brian J. L. Berry, "An Approach to Regional Analysis: A Synthesis," *Annals of the Association of American Geographers*, vol. 54 (March 1964), pp. 1-12.
4. William D. Pattison, "The Four Traditions of Geography," *Journal of Geography*, vol. 63 (May 1964), pp. 211-16.
5. Richard L. Morrill, *The Spatial Organization of Society* (Belmont, Calif.: Wadsworth Publishing Co., 1970), p. 31.
6. An historical review of the spatial tradition as it relates to man-land and area studies is presented in Edward J. Taaffe, "The Spatial View in Context," *Annals of the Association of American Geographers*, vol. 64 (March 1974), pp. 1-16.
7. Rhoads Murphey, *An Introduction to Geography*, 3rd ed. (Chicago: Rand McNally & Co., 1971), p. 52.
8. Peter Haggett, *Geography: A Modern Synthesis* (New York: Harper & Row, 1972), pp. 10-11.
9. John J. Hidore, *Physical Geography: Earth Systems* (Glenview, Ill.: Scott, Foresman and Co., 1974).
10. Alan Grey reinforces the need for a multiple approach to maintain vitality in the discipline in his paper, "Geography A La Mode: or Paradigms for Sale," *Great Plains-Rocky Mountain Geographical Journal*, vol. 1 (1972), pp. 33-39.
11. See, for example, Robert C. Lucas, "Wilderness Perception and Use: The Example of the Boundary Waters Canoe Area," *Natural Resources Journal*, vol. 111 (1963), pp. 394-411; Thomas F. Saarinen, *Perception of Environment*, Commission on College Geography Resource Paper No. 5 (Washington, D.C.: Association of American Geographers, 1969); and Gilbert F. White, ed., *Natural Hazards—Local, National, Global* (New York: Oxford University Press, 1974). See also Arthur N. Strahler, "The Life Layer," *Journal of Geography*, vol. 69 (February 1970), pp. 70-76, and Peter Kakela and Robert W. Christopherson, "Life Geosystems: or New Life to Physical Geography," *Journal of Geography*, vol. 71 (March 1972), pp. 140-46, for outlines of approaches to environmental studies in physical geography.
12. See, for example, Yi-Fu Tuan, "Humanistic Geography," *Annals of the Association of American Geographers*, vol. 66, (June 1976), pp. 266-76; Tuan, *Topophilia: A Study of Environmental Perception, Attitudes, and Values* (Englewood Cliffs, N.J.: Prentice-Hall, 1974); Cole Harris, "Theory and Synthesis in Historical Geography," *Canadian Geographer*, vol. 15 (1971), pp. 157-72; David Lowenthal, "The American Scene," *Geographical Review*, vol. 53 (July 1964), pp. 309-46; and D. W. Meinig, "The Beholding Eye: Ten Versions of the Same Scene," *Landscape Architecture*, vol. 66 (January 1976), pp. 47-54.
13. Meinig, "The Beholding Eye." It probably follows that a place cannot be understood by proxy. It may even be concluded that a place can never be fully understood, inasmuch as no one can experience all the composition, character, and meaning a place has to offer. Perhaps we are limited to mere appreciation, always falling short of full understanding.
14. See Yi-Fu Tuan, "Place: An Experiential Perspective," *Geographical Review*, vol. 65 (April 1975), pp. 151-65.
15. D. W. Meinig, personal communication.
16. One such program was developed under a National Science Foundation grant to Granite School District, Salt Lake City, and the University of Utah Geography Department.
17. Taaffe et al. assert that, "the contemporary stress is on geography as the study of spatial organization expressed as patterns and processes." See Edward J. Taaffe, ed., *Geography* (Englewood Cliffs, N.J.: Prentice-Hall, 1970), pp. 5-6. This book is a report of the Geography Panel of the Behavioral and Social Sciences Survey, Social Science Research

Council—Behavioral Science Division of the National Academy of Science-National Research Council. Although this book has a strong bias toward spatial tradition, the spatial pattern (sometimes called spatial structure or spatial distribution) and spatial process framework is a sound foundation for physical and human environmental studies as well. The humanistic/experiential tradition cannot be accommodated under this analytical framework and must be regarded as an important part of modern geography.

18. The "distinctively geographical question," as Abler, Adams, and Gould have put it, is "why are spatial distributions structured the way they are?" See Ronald Abler, John S. Adams, and Peter Gould, *Spatial Organization: The Geographer's View of the World* (Englewood Cliffs: Prentice-Hall, 1971), p. 56. Perhaps they would allow this expansion of their basic question into three parts: What *is* the structure of the spatial distribution? How did it come to be (can we explain it)? and How and why is it changing (can we monitor and predict it)?
19. William Warntz, personal communication.
20. One of the readable "digests" of this growing area available in soft cover form is Robert D. Rudd, *Remote Sensing: A Better View*, (North Scituate, Mass.: Duxbury Press, 1974). For a practical, ready-to-use classroom set of exercises using remote sensing in the study of landforms, water resources, vegetation, and agricultural and urban land use, the teacher may order from the Government Printing Office, Merrill K. Ridd, Roger M. McCoy, and Reynold D. Willie, *Studying the Earth from Space*, (in press). Following a brief introduction contained in the set, the student may identify spatial patterns of various kinds and infer spatial processes, both natural and human, from features observable on the images. A detailed teacher's guide is included. The material is applicable at levels from elementary to high school and beyond.
21. High school teachers may find it feasible to use some of the simpler statistical techniques for examining spatial patterns. See, for instance, John Fraser Hart, "A Census Tract Exercise in Local Geography," *Journal of Geography*, vol. 71 (Sept. 1972), pp. 326-39.
22. Abler, Adams, and Gould, *Spatial Organization*, p. 62.
23. The teacher may be interested in the potential classroom application of the many ideas presented in Peter Gould and Rodney White, *Mental Maps* (Baltimore: Penguin Books, 1974), and Roger M. Downs and David Stea, *Image and Environment: Cognitive Mapping and Spatial Behavior* (Chicago: Aldine Publishing Co., 1973). Explorations into relative distance and relative space have led to a fundamental challenge of Kant's apparent general conception of absolute space, as non-Euclidian geometry has increased in use. However, Kant in earlier writing apparently allowed for this relativistic view. See M. Jammer, *Concepts of Space* (Cambridge, Mass., 1954), p. 130. All statements on location are relative to some arbitrary frame of reference—even excluding latitude and longitude. The term, relative, as used here extends beyond the space dimension to encompass the time dimension as well as perception and cognition.
24. The analysis of a single pattern of distribution may be of interest from a statistical point of view. That is, as geographers, we are interested to know whether a distribution is random or nonrandom. If nonrandom, then the question arises, "What causes this pattern?" This calls for examination of another distribution.
25. It should be noted that sometimes the two distributions are causally interrelated, or, as Alber, Adams, and Gould say (*Spatial Organization*, p. 60), are circularly causal—that cause and effect go both ways between the two variables. For example, the expansion of subdivisions stimulates the construction of new shopping centers which, in turn, influence the pattern of new housing development. The spatial processes involved between the two patterns would be understandable to the students. Likewise, although corn may be called the independent variable influencing the location of hogs, the dependent variable, surely the patterns reinforce each other.
26. By "folk knowledge" we mean the knowledge that arises from casual observation and typically describes rather than explains. A farmer, for example, may know from experience

that a certain cloud formation is an omen of rain. He makes no attempt to seek an explanation nor to observe systematically the relationship between the clouds and rain. Whereas the layman may deal with folk knowledge, the school fosters "scientific knowledge," which differs from folk knowledge in that it depends on deliberate, systematic observation carried out with forethought, and attempts to explain why and how things happen. See Kenneth Boulding, *The Meaning of the Twentieth Century: The Great Transition* (New York: Harper & Row, 1964).

27. Rhoads Murphey, *The Scope of Geography* (Chicago: Rand McNally College Publishing Co., 1973), p. 41.
28. It will become evident that there are spatial patterns of phenomena "in place" and spatial patterns of moving phenomena (sometimes called spatial interaction). In either case the pattern can be traced to spatial process(es) causing it.
29. Circulation is to varying degrees a three-dimensional process. The spatial components are those of greatest concern to geographers, although they typically deal with the entire process (vertical and horizontal) as an entity in order to understand the spatial aspects and implication.
30. A readable and graphic summary of the applications of transportation geography studies is presented in James O. Wheeler, *The Urban Circulation Noose* (North Scituate, Mass.: Duxbury Press, 1974).
31. See ibid., Chapters 2 and 3.
32. George B. Dantzig and Thomas L. Saaty, *Compact City: A Plan for Livable Urban Environments* (San Francisco: W. H. Freeman and Co., 1973).
33. For a set of classroom activities, see HSGP, *Geography in an Urban Age*, Unit 1, *Geography of Cities*. The activity, "Sizes and Spacing of Cities," deals with trade areas and networks in the hierarchy of cities, while "Local Shopping Survey" is a "student-sized" research project dealing with a dynamic cell of activity at the local level of the hierarchy. The latter activity will give the student a tangible experience with the spatial patterns and processes of transportation and circulation in the context of his own world with which to relate to the broader cells of activity in the ascending hierarchy of towns and cities. Extension of the discussion to metropolis and megalopolis would be appropriate. See the "Megalopolis" activity also in Unit 1. Also see Wheeler, *The Urban Circulation Noose*, pp. 112-16.
34. See Peter R. Gould, *Spatial Diffusion*, Association of American Geographers Resource Paper No. 4, Commission on College Geography (Washington, D.C.: Association of American Geographers, 1969). Gould also discusses several barriers to diffusion, such as physical, cultural, linguistic, religious, political, and psychological constraints in the spread of information and ideas. This paper is included with some revision in Abler, Adams, and Gould, *Spatial Organization* as Chapter 11.
35. To stimulate thinking, see HSGP, *Geography in an Urban Age*, Unit 3, *Cultural Geography*. See expecially, "A Lesson from Sports," and "Games Illustrating the Spread of Ideas" (expansion diffusion), and "A Trend toward Uniformity" (a combination of expansion and hierarchical diffusion). From Unit 1, *Geography of Cities*, see "Migrants to the City" (relocation diffusion).
36. For activities involving historical and dynamic aspects of the urbanization process, see HSGP, *Geography in an Urban Age*, Unit 1, *Geography of Cities*. In the activity called "Portsville," students use historical data to build a model of what turns out to be a real city, Seattle; in "A Tale of Three Cities," they trace the relative growth rates of Boston, New York, and Philadelphia; and in "Bruges," they see that cities may not grow. "Megalopolis" deals with the coalescence of growing urban centers into continuous expanses of urbanizing landscape.
37. See HSGP, *Geography in an Urban Age*, Unit 5, *Habitat and Resources*, "Waste Management" activity, dealing with solid, liquid, and gaseous waste.
38. Murphey, *The Scope of Geography*, p. 50.

39. In recent years systematic geography, human and physical, has become more analytical, inductive, and theory building. Obviously this is easier when isolating only one or two systems for analysis as opposed to the whole realm of interacting natural and human systems in a region. For further discussion on the so-called dichotomy between physical and human (cultural) geography, see Richard Hartshorne, *Perspective on the Nature of Geography*, AAG Monograph Series No. 1 (Chicago: Rand McNally & Co., 1959).
40. See Richard Hartshorne, "The Nature of Geography," *Annals of the Association of American Geographers*, vol. 29 (Sept. 1939), pp. 173-658.
41. See David Harvey, *Explanation in Geography* (Great Britain: Edward Arnold, Publishers, 1969), p. 125.
42. Haggett, *Geography: A Modern Synthesis*, p. 5.
43. Gordon J. Fielding, *Geography as a Social Science* (New York: Harper & Row, 1974), p. 38.

3

Developing Curriculum For Geographic Education

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Today's educational climate is one where change, innovation, relevance, and accountability are normal rather than exceptional. For teachers this is an exciting and challenging time which affords opportunities to implement new curricula and experiment with new approaches to teaching and learning. Unfortunately, it is also a time when teachers are faced with a bewildering array of options and admonitions about what constitutes the "best" curriculum. This chapter is intended to provide a framework for helping teachers make curriculum decisions. The framework scarcely solves the problems facing today's teachers, but it should help. The authors also believe that the teaching of geography will be enhanced by greater involvement of teachers in the process of curriculum development and implementation. Before proceeding to a discussion of the framework, the current situation will be examined more closely insofar as geography is concerned.

Geography in the Curriculum

"The old school geography is not so structured as to survive in relation to the new curricula."[1] This judgment, recently rendered on the prospects of geography's role in the social studies curricula of the schools, makes clear one significant characteristic of current thinking about curriculum: traditions are being challenged. One such tradition is the preeminence of history and geography as the foremost contributors of content to the social studies curriculum. Several years ago, Bacon noted the passing of the travelogue approach to the teaching of geography in which the focus was on "strange lands and exotic people."[2] To the extent that this is replaced by a conceptual approach to the teaching and learning of geography, the passing of this tradition is not to be lamented. What is of serious concern to those who value the geographic perspective in the social studies curriculum is the possibility that geography will "lose out" to sociology, anthropology, psychology, and so forth.

What are the prospects for the survival of geography in the schools? To what extent and in what form will it survive? What can teachers committed to the discipline do to preserve its integrity? How can they create and maintain its place in the curriculum? Definitive answers to these questions are not easy, but the search can begin by analyzing some recent efforts aimed at revamping and revitalizing geography in the schools. The focus will be on curriculum frameworks and principles rather than teaching strategies. The remaining chapters provide illustrations of the latter.

Geography in the Secondary School Curriculum

At the secondary school level the most widely publicized effort in geography has been the High School Geography Project (HSGP), currently marketed as *Geography in an Urban Age.*[3] Developed through a tremendous investment of human and financial resources, HSPG provides one alternative for courses in geography. The six units comprising HSGP—Geography of Cities, Manufacturing and Agriculture, Cultural Geography, Political Geography, Habitat, and Japan—can be used sequentially to comprise a year's course of study or used separately as parts of several different courses; thus, HSGP is not a tightly sequenced course with each unit being dependent on all or some of the others. The scope and flexibility of the HSGP project led two reviewers to observe that it could "easily be construed as a required, interdisciplinary culmination to social studies in the twelfth grade," and to raise the possibility of including HSGP units in anthropology, history, and/or sociology courses.[4] Such usage may represent a discrepency between the goals of the producers of HSGP and those of its consumers, for the initial selection and organization of content was primarily an attempt to "narrow the gap between the discipline as it is taught in the high school classroom and the frontiers of current research and professional thinking in geography."[5]

Another national project in which a good deal of geography was integrated into interdisciplinary science is the Earth Science Curriculum Project (ESCP), marketed as *Investigating the Earth,* also designed for secondary school.[6] It can be said that while the HSGP emphasizes cultural or human geography, ESCP incorporates fundamentally physical geography. It should be more widely recognized than seems to be the case that these two curriculum projects conceptually and practically complement each other to establish a broad base geography for secondary school. Either one without the other leaves half the field untilled.

It is quite obvious that the era of national curriculum projects and massive federal funding for curriculum development is over for now. To wait for alternative geography courses to be developed in the same manner as the High School Geography Project is as futile as thinking that a regional type HSGP course will eventually materialize from federal funds. The current concern of federal agencies is the dissemination and utilization of the materials already created through federal funding. However, one of the major rationales for the High School Geography Project and a criterion of success articulated in the Final Report was whether it will have generated a series of competitive courses. Its purpose was to serve as a model and source of motivation for the continuing improvement of geographic instruction and course development. The national curriculum projects including HSGP and ESCP were not and should not be viewed as final products, but rather as the beginnings of a much needed revision of science, social science, and geographic education.

An approach to course development which is considerably different from HSGP is offered by the Ontario Ministry of Education.[7] While there is no neglect of key geographic concepts and methodology, this approach differs markedly from HSGP and ESCP in the process of course development. In this instance the emphasis is on local rather than national development of geographic curricula. It is primarily in this respect that the Ontario approach offers the teacher a clear alternative to accepting or rejecting a completed curriculum package. Geographers and educators at the provincial level take the major responsibility for providing an outline of suggested themes, concepts, and methods for teachers in local school districts who then have the responsibility and task of developing and organizing specific courses of study.[8] With the continued assistance of provincial geographers and curriculum specialists it is believed this framework will lead to curricula which are geographically sound and uniquely suited to a given school situation.

Geography in the Elementary School Curriculum

On the elementary school level it is becoming increasingly difficult to find entire courses of study which are identified as geography. One example of an elementary school course which stands apart from the trend toward interdisciplinary or multidisciplinary social studies programs is the Geography Curriculum Project developed at the University of Georgia.[9] According to its developers this project provides data and experiences which are clearly identified with the single discipline—geography. Furthermore, one primary grade course—*Earth: Man's Home*—is based on the single concept of man's habitat.[10] This approach clearly maintains the identity of geography as a distinctive discipline and introduces it early in a student's educational experience. Space does not permit a more detailed description of the Geography Curriculum Project, but readers are cautioned not to interpret this effort as a traditional or narrow effort in curriculum development. The major and supporting concepts, while drawn from geography, do provide a basis for broader learnings.

The majority of social studies and science programs at the elementary school level today reflect an interdisciplinary or multidisciplinary approach to curriculum.[11] Examples of this type of framework are too numerous to describe or identify at length. Suffice it to say at this point that the quantity and quality of geographic content varies both within and among many of these programs. In all fairness to the developers and publishers of these programs, it must be noted that the opportunities for geographic learnings abound even if teachers are not clearly alerted to these opportunities in all instances. However, a few programs such as the Field Elementary Social Studies program and Macmillan's Focus on Active Learning series blend an interdisciplinary approach with a strong emphasis on a geographic base.

An analysis of these diverse approaches to geography and the social studies and the sciences begins to provide some alternative responses to the questions raised earlier in this chapter. However, it would be misleading to convey the impression that all one has to do is shop around among existing programs. Other factors need to be considered and dealt with by those who seek to develop valid and viable courses in geography. Two factors are especially noteworthy: recent trends in social studies and science education and emerging school administrative and organizational practices.

Factors Influencing the Geographic Curriculum

In the area of social studies education, perhaps the event of greatest significance to curriculum development is the publication of the National Council for the Social Studies Curriculum Guidelines.[13] It would not be unreasonable to presume that this document, with modification, will become a set of standards against which social studies programs and geography courses will be judged. What is it that these guidelines are asking of teachers and curriculum developers? To anyone familiar with them, the answer is obviously "a great many things." Among the many specific recommendations in the guidelines a few with major emphases stand out: the need for valid, realistic, and unbiased knowledge; a problem or issue orientation to curriculum organization; the need to develop more fully the cognitive abilities of students; the need to deal with values and valuing; and the desirability of students to become more socially active outside the classroom as part of their education. Highlighting these emphases is not meant to imply that courses in geography are not capable of responding to them; in fact, there is no reason to believe that geography is any less well-equipped to speak to each than any of the other sciences or social sciences. The more crucial question is, "Will the materials and learning experiences be developed to meet these challenges?" The authors believe that these challenges can be met by geographic educators and that some of the means to develop appropriate courses are already available. This chapter as well as other chapters in this volume present some suggestions toward that end.

In the realm of school administrative and organizational practices, perhaps the most significant fact is that it is hardly typical for geography to be required in the secondary or elementary school; hence, there is no great built-in demand for courses in geography. However, burgeoning "mini-courses" and increased elective offerings are providing a greater opportunity for more geography courses to enter the academic marketplace and attract greater numbers of students. On the elementary school level the "open classroom" concept creates an analogous situation wherein students are acquiring a greater voice in what they will study and a wider array of choices from which to choose.

Documents such as the Social Studies Curriculum Guidelines and practices such as "mini-courses" and the "open classroom" provide unprecedented opportunities for teaching and learning geography. Their charge to the teacher is clear—Be creative! Be innovative! Break away from the poorer elements of past practices! Make your offerings current, relevant, and interesting! Integrate geography into your program! But how? The next portion of this chapter discusses alternative views of the teacher's role and responsibilities in the curriculum development process. In this section the belief will become clear that the key to better geographic education is greater local initiative and involvement of classroom teachers in the process of developing and implementing curriculum with support from the professional geographer.

The Role of the Teacher

The recommendation that teachers should be the focal point of the curriculum development process immediately and invariably elicits a series of negative responses.

It sounds like a naive pedagogical "truism." It seems to imply that classroom teachers must assume total responsibility for the development of the geography curriculum in addition to all of the other demands placed on them. It appears to ignore a realistic appraisal of what is feasible in a public school situation in terms of time and resources available to teachers. Finally, that recommendation might appear to mean that the valuable experiences and outcomes of the national curriculum projects of the sixties should be ignored. It is believed that none of these responses is valid; however, discussion will be confined to the last objection: ignoring the contributions of national curriculum projects.

The Teacher and National Curriculum Projects

Research is beginning to reveal a common element and glaring inadequacy of the national curriculum projects: failure to deal with the role and responsibility of the classroom teacher. The overall approach employed by the projects has been referred to as the "Linear Model of the Curriculum Change Process" (Fig. 3.1).[17]

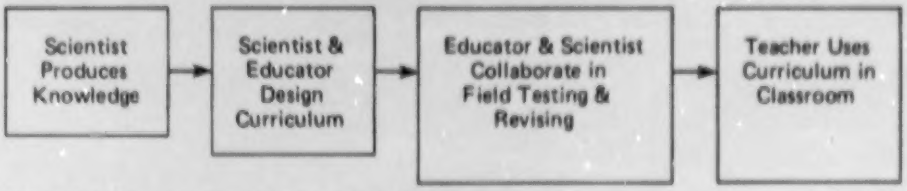

Scientist Produces Knowledge
Scientist & Educator Design Curriculum
Educator & Scientist Collaborate in Field Testing & Revising
Teacher Uses Curriculum in Classroom

Figure 3.1. The linear model of curriculum change.

In this model the primary roles are those assumed by the subject-matter specialist, i.e., the scientist, and the education specialist. During the early stages of the process questions concerning *what* should be taught take precedence and are the primary concerns of the subject-matter specialist. The question of *how* it is to be organized and presented in the classroom is primarily the job of the professional educator whose role becomes greater as decisions move toward design and implementation of the curriculum. This shift in role responsibilities provides the basis for extensive cooperation between the subject-matter specialist and education specialist and is one of the hallmarks of the national curriculum projects. Generally, teachers are the recipients of the information and decisions. Their involvement is minimal except for field testing, and they are given little opportunity to influence the basic content and curriculum design.

In terms of the development process employed, the High School Geography Project followed the linear model. The role of the teacher was primarily one of field testing the material, collecting data from students, and making classroom observations concerning the "teachability" of the various activities. This information was utilized in the revision of the various activities and units and in this sense one could say that classroom teachers were involved. Among the national curriculum projects, the High

School Geography Project is noteworthy for involving the greatest number of teachers in field testing and having one of the most extensive evaluation and field testing operations. Nonetheless, the teachers' role was secondary, for they made no decisions directly. They were perceived as recipients of information and as implementers of the material developed by the project. Decision making was centralized, and teachers became consumers of a product which reflected only a very general perspective concerning the students to be served, the type of school to be served, and the type of learning situation to be engendered.

Impact of National Projects

Removing classroom teachers and local school districts from the decision-making process during the initial phases of curriculum development leaves only one possibility wherein choice can be exercised, and that is whether to utilize the material or not. While data concerning the impact of the High School Geography Project on classroom instruction have not been gathered, indications are that it has entered a very small percentage of the nation's geography classes. With a few exceptional successes to point to, there has been a question as to whether large-scale curriculum innovations are feasible. In the case of the Earth Science Curriculum Project, the program was readily accepted, competing favorably with the leading commercial earth science programs. It is noteworthy that teachers were directly and substantially involved in the writing and decision making from the beginning. This may partially explain the widespread acceptance of the program. However, as Herron points out, many of the science curriculum projects have had little impact in terms of the daily routine of the classroom. The number of schools using the material is limited, and observation in many of the schools that have adopted the materials indicates that the material is "gathering dust in the back corner of the room."[14] It would seem teachers and supervisors are exercising their "consumer's perogative."

The problem then is that "regardless of the merit of the new materials, the large investment that they represent may fail to change geography and the social studies because of the difficulties of getting acceptance and understanding on the part of teachers, administrators, and the public."[15] Inherent in the problem of "acceptance and understanding" are two approaches to its resolution. One approach advocated especially by people associated with national curriculum projects is concerned with teacher education. The approach revolves around pre-service and in-service training; specific strategies include teacher kits, summer institutes, and workshops. The second approach is concerned with the provision of resources and assistance to the classroom teacher in order to get him involved in curriculum development. This approach emphasizes teachers' needs, interests, and roles in the classroom. It recognizes the disparity that often exists between the problems of curriculum developers and the problems of classroom teachers and attempts to grapple with the differing perceptions associated with a given product. Thomas Glennan, Director of the National Institute of Education, has summarized this latter situation succinctly:

> One certainly has the feeling that many of the products that have been developed in the past—textbooks, entire program activities—simply haven't exported well. . . . And one

> of the reasons is that people haven't really understood what the needs of teachers are. What kinds of needs, let's say, do they have for feeling that they have a role to play, as opposed to just parroting what's in the curriculum?''[16]

Both approaches are concerned with the problem of taking the ideas and products of curriculum development to the point where they have an impact on daily instruction in the classroom. Both approaches have merit and address themselves to a crucial problem. However, the first approach assumes that resistance to innovation can be overcome with additional training; the second approach challenges the traditional framework employed in the curriculum development process, and regards the source of the problem as a need to develop a framework wherein the teacher is the agent of change.

Action Research

One particular model, not directly concerned with curriculum development but which places the teacher at center stage in terms of decision making, is Stephen Corey's model of ''action research.'' In his book *Action Research to Improve School Practices*, Corey states:

> The thesis of this book is that teachers, supervisors, and administrators would make better decisions and engage in more effective practices if they, too, were able and willing to conduct research as a basis for these decisions and practices. The process by which practitioners attempt to study their problems scientifically in order to guide, correct, and evaluate their decision and actions is what a number of people have called action research.[17]

Corey argues that action research should not only be carried on by those at universities and colleges, but also by teachers and administrators dealing with problems germane to their particular situation. The call for action research has had limited impact on school practices. Corey believes this is attributable to two factors: (1) the necessity to deal with generalizable situations when doing conventional research; and (2) the fact that few teachers have engaged in the research process. If the action research concept is to play a role in curriculum development, as the authors think it should, then it is important that each of these factors be examined more closely.

The Generalizable Situation

The very nature of research requires that the sample or group under investigation and the results derived from that investigation be representative of a larger population; further, the results of the investigation should have applicability to situations outside of the research context. The concern of conventional researchers is not with the particular groups they are using as subjects in their investigations; rather, they intend that these groups can be shown to be representative of a larger population. On the other hand, problems and questions raised by classroom teachers are just the opposite of those asked by conventional researchers. The teacher's concern is the immediate or particular group being worked with. His/her concern is not generalization to a large population; rather, it is concern with making better decisions about the particular group being worked with. The teacher's concern is not generalization to a larger population; rather it is concern with making better decisions about the class. According to Corey, traditional research is concerned with "lateral extensions of generalization," or extending generalizations to a larger group, while action research is concerned with "vertical extension of generalizations," or extending generalizations toward future action in a particular school.[18]

The conflict between "conventional research" and "action research" is reflected in national curriculum projects where centralization of decision making requires that inputs such as the nature of the students, the purposes and content, and the problems and issues be of a generalizable nature; in other words, it is assumed they are shared by all prospective users of the curriculum. But Herron found in his research on curriculum innovation that quite often teachers did not recognize the problems which generated the curricular change; therefore, the needs considered by the curricular innovation were not the needs of the classroom teacher.[19] When curriculum development employs an "action research" point of view, the problem examined, the curriculum articulated, the particular unit developed, or the materials utilized necessarily originate and reside within the context of the particular population or situation. The resulting conclusions and products may not be applicable to the entire field of geographic education; however, they are applicable to the particular school or school district.

The Teacher as Researcher

The second factor accounting for the limited impact of research on the schools—removing the teacher from the process—is obviously related to the first. Corey notes the gap between research findings and the lack of change in school practices and explains that ". . . the difficulty is deeper than communication, and is related to important principles of learning."[20] The lack of involvement by teachers in research, or even in defining the problems to be investigated mitigates against extensive behavioral change on the part of the teacher. The critical question is not how to present research in a certain fashion or how to train teachers in order to expedite the research-to-implementation process; rather, the crux of the issue is how to involve the teacher in the learning process associated with the research itself. If the teacher is not engaged in the learning process associated with research, recognizing the problem, gathering the data, and so forth, the possibility that research will have meaning and that change in school practices will occur is diminished. Corey states:

> When he defines the problem, hypothesizes actions that may help him cope with it, engages in these actions, studies the consequences, and generalizes from them he will more frequently internalize the experience than when all this is done for him by somebody else, and he reads about it.[21]

The learning process as viewed by Corey is active not passive; the teacher must interact with the problem and the material, not just read about it. Changes in behavior and practices are assumed to be enhanced when the teacher is involved in the process. The very act of proposing a certain course of action, of thinking through the implications, of actually engaging in the action, and evaluating the consequences of this proposed course of action draws the teacher/investigator into the process of research and its values are internalized.

Results drawn from the experience are likely to have direct and meaningful application because the questions have been posed by the teacher and the answers are immediately relevant, significant, and interesting.

Corey's statement concerning the need for the teacher to be actively involved in the action research process parallels numerous statements advocating inquiry strategies as teaching techniques and accurately characterizes the role of the learner envisioned by the developers of the High School Geography Project. However, in the curriculum development process the idea of active participation by teachers is too often ignored. To assume that "discovery," "inquiry," "inductive," or "reflective" learning situations are desirable for students but not for teachers seems to negate the very premises underlying the High School Geography Project and suggests that teachers are unable or unwilling to contribute and benefit from such learning situations. If classroom teachers withdraw from the process of curriculum research, they are preventing themselves from experiencing the very type of learning situation they expect to present to their students. Just as the removal of teachers from the research process diminishes the possibilities of teachers changing their behavior or practices, so too the removal of teachers from the curriculum development process diminishes the possibilities that the type of curriculum changes advocated and developed will be implemented.

> Teachers will take reform seriously only when they are responsible for defining their own educational problems, delineating their own needs, and receiving help on their own terms and turf.[22]

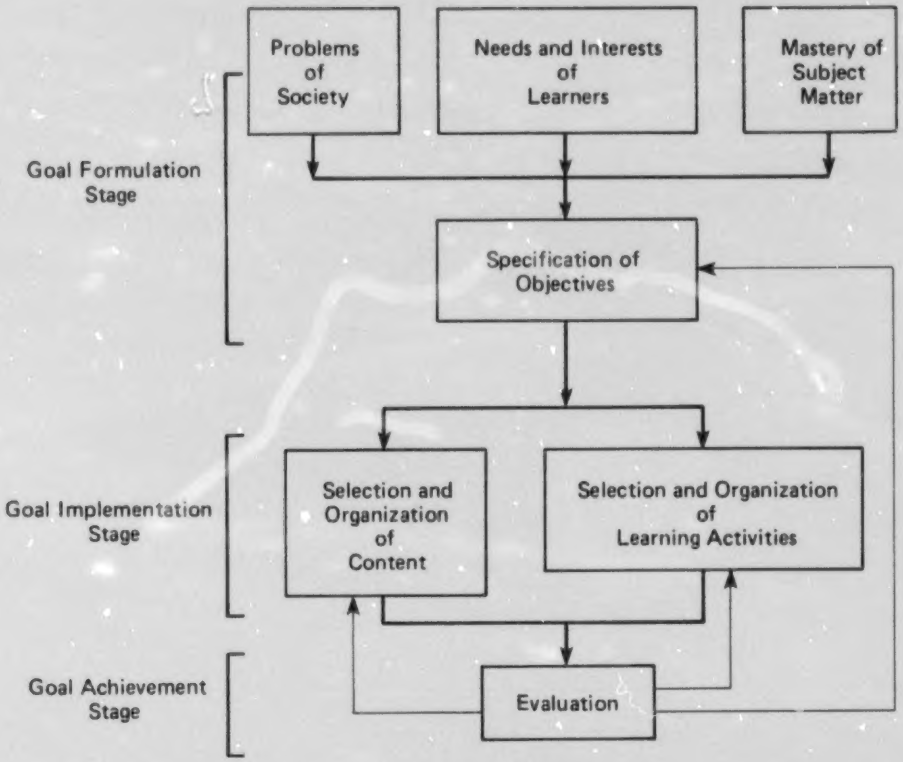
A Conceptual Framework for Designing Geographic Curriculum

The curriculum developer/teacher must be concerned with three kinds of questions: questions about goals, questions about content, and questions about strategies. Traditionally, the answers to these questions were placed in curriculum guides which, in fact, usually did nothing more than list the sequence of topics to be dealt with. Such curriculum guides are becoming a thing of the past, for the concept of curriculum which has emerged from the recent social studies projects has been enlarged to include *why* one is dealing with a body of knowledge, *what* one hopes to achieve, and *how* one is going to achieve it, three separate but highly interrelated issues.

The problem faced by the curriculum developer is similar to the problem faced by the research geographer: the scope and complexity of the situation is potentially overwhelming. However, by using an appropriate conceptual framework the curriculum developer is able to generate questions which can aid him in identifying the problems, obtaining and ordering the data, and judging the significance of certain relationships. By integrating the action research model with a curriculum development framework, some of the problems discussed in the following pages can be solved. The action research model makes its contribution by providing a data base for making curriculum decisions. In some cases action research will be the only source of data available to a local district. In other cases where more extensive research data exist, an action research approach can reduce the problem of generalizing findings from the population used in the study to the known student population in a given school district. Combining action research with a conceptual framework makes at least three additional contributions to curriculum development. First, it provides a comprehensive framework which serves to insure the integrity, or logical consistency, of both the curriculum and the instructional practices based on it. Second, it serves as a basis for generating questions which can guide research relating to existing materials. Third, it insures that if the teacher is doing the action research, the teacher will be asking the questions, defining the goals, determining the strategies, and making the changes in the classroom. While it is obvious that action research can be pursued and a curriculum framework applied independently of one another, it should also be obvious that concurrent utilization of both yields a greater potential benefit to the curriculum developer and to the teacher.[23]

The Tyler-Taba Model: Goal Formulation

One basic conceptual framework that is widely used in curriculum development is known as the "Tyler-Taba Model"; a simplified version is shown in Figure 3.2.[24] The



Problems of Society
Needs and Interests of Learners
Mastery of Subject Matter
Goal Formulation Stage
Specification of Objectives
Goal Implementation Stage
Selection and Organization of Content
Selection and Organization of Learning Activities
Goal Achievement Stage
Evaluation

Figure 3.2. Model for curriculum development. (From Hilda Taba, *Curriculum Development: Theory and Practice* (New York: Harcourt, Brace and World, 1962); and Ralph Tyler, *Basic Principles of Curriculum and Instruction* (Chicago: University of Chicago Press, 1949).

Tyler-Taba Model is divided into three stages, each stage representing one phase of the curriculum development process. The first stage, Goal Formulation, begins with a determination of the ultimate purpose of the curriculum—dealing with the problems of society, responding to the needs and interests of the learners, and/or mastering a body of subject matter—and culminates with the formulation of instructional objectives which are consistent with that purpose.

Determining the purpose of the curriculum structures subsequent choices and alternatives. For example, choosing the "nature of subject matter" alternative could lead one to look toward the discipline of geography for its major concepts, generalizations, theories, and methodology as the first step in designing the course. The primary concern could be providing the best representation of urban geography as a scientific study. Choosing the "problems of society" alternative could cause one to analyze society in terms of fundamental and pervasive human issues and design a curriculum around them. Knowledge would be drawn from geography as well as other disciplines but *all* that geography has to offer would not be utilized; "coverage" would be sacrificed in favor of selected knowledge determined by the nature of the problems. Choosing the "needs and interests of learners" alternative could result in a highly individualized, open curriculum which is responsive to the goals of each student. Solving social problems and mastering subject matter may or may not find its way into the curriculum; at best, they are only a means to an end.

The High School Geography Project clearly emphasizes subject matter and can be characterized as a structure of the discipline curriculum. This does not mean that the HSGP excluded concern for the needs of society or the needs of students; the societal dimension was usually incorporated in the examples of problems included in the units, and the student dimension was incorporated in the inclusion of learning activities and materials which fostered an active role on the part of the learner. However, in terms of the organizing principles of the curriculum, the scope and sequence is primarily based on the logic or demands of the subject matter; societal and student needs assume a secondary role. The problem of emphasis was compounded by the necessity of determining which structure of the discipline to present as the basic foundation. The decision was made in favor of an emphasis on the systematic or topical approach to the study of geography, an approach which often baffles students who are expecting the customary survey of the regions of the world. In other words, the High School Geography Project is based on the developers' perception of the structure of the discipline; its organization does not make sense until and unless those examining the materials recognize that important fact.

We believe the difficult task of developing geographic curricula reflecting all three inputs must be attempted if geography is to continue to meet contemporary educational challenges. This need was clearly articulated by Clyde Kohn when he called for "A Balanced Approach to Developing a Geography Curriculum" and noted that in geography courses ". . . we see programs being proposed in which these three needs are not in balance."[25]

Pattison conveys a similar message in his discussion of the need for cooperation between geographers and professional educators. He indicates that the point of view of the subject matter specialist is only one aspect of the geography curriculum in the public schools.[26] It is tempting for geographers to feel that the organizing principles for a curriculum can be derived solely from the logic and structure of their discipline. However, the geographer who engages in curriculum development must consider the contributions geography can make to the needs of society and to the needs of students, while at the same time maintaining the rigor necessary for the development of sound geographic inquiry skills, concepts, and insights.

The second phase of the Goal Formulation Stage is the specification of learning objectives in clear, precise terms. One approach to this task has been offered by Clegg who suggests that most of the objectives for geographic education fall into two categories:[27]

> 1. Content (or product) objectives which involve the development of important facts, concepts, and generalizations selected from the various aspects of the discipline of geography.
> 2. Learning process objectives which include a wide range of cognitive and affective activities such as comparing, contrasting, predicting, forming hypotheses, valuing, and decision making. Also included are particular geographic skills such as interpreting map symbols, locating a place by grid coordinate, estimating distance . . . [and so forth].

Whether they are content or process in nature, objectives should translate broad curriculum goals into specific operational statements of what it is that students should know, do, or believe as a consequence of instruction; in general, goals are appropriate for the course or program level whereas objectives are stated at the lesson plan, or instructional sequence level. Table 3.1 offers examples of moving from broad program goals to objectives for specific lessons. Completion of the objectives signifies readiness for the next stage of the development process.

The Tyler-Taba Model: Goal Implementation

Goal implementation involves the selection and organization of the content and learning activities that are most likely to bring about attainment of the objectives. During this stage specific content is chosen, teaching strategies are designed, and learning activities are planned. In terms of selecting specific content, numerous choices must be made. Should a broad array of concepts and generalizations be pursued, or would a tightly integrated theory be a better curriculum organizer? Would a case study of the local area be sufficient for the development of selected geographic concepts or should comparative studies be developed? Would an historical dimension be beneficial in terms of the realization of objectives or is a contemporary focus sufficient? Is "raw data" to be given preference over data which has already been organized and interpreted? Questions related to the organization of content are primarily ones of sequence. Should main ideas be introduced before applying them in a setting such as a region or should a setting be surveyed before "zeroing in" on a main idea? Should data from the past be introduced before data from the present? Should content drawn from the local area precede content drawn from more distant areas? Should key concepts be developed before, during, or after examination of selected problems?

The process of designing and sequencing learning activities cannot and should not be separated from the process of selecting and organizing of content. Both are

TABLE 3.1
Levels of Generality of Goals and Objectives

Program Level Goals	Students will understand the concept of region.	Students will use geographic methods of inquiry.
Unit Level Goals	Students will know that the attributes of the concept region are: (1) it is a hypothetical construct, (2) it is homogeneous in terms of the criteria, (3) depending on the type of region, the boundaries may be indistinct or indefinite.	Students can interpret topographic maps effectively.
Lesson Level Objectives	Given a map showing two distributions that overlap, students will be able to draw a boundary separating the two regions.	Given a topographic map of scale of 1:50,000, students will measure straight-line distances accurately to within 1/10 of a mile.

Source: Dana G. Kurfman, "Evaluation Developments Useful in Geographic Education," in *Evaluation in Geographic Education*, Dana G. Kurfman, ed., 1971 Yearbook of the National Council for Geographic Education (Belmont, Calif.: Fearon Publishers, 1970), p. 8.

necessary and interdependent for the attainment of the objectives. Taba is quite explicit about the role of learning activities. On the one hand, she states:

> All objectives, except those of knowledge, need to be implemented by appropriate learning activities designed to help students develop and practice the powers and the behaviors they are supposed to learn. Achievement of objectives [related to] thinking and attitudes are relatively independent of the content but highly dependent on the type of learning experiences or processes which are used.

On the other hand, Taba goes on to caution against purposeless activity:

> The first rule to observe in selecting the learning experiences for each idea and its content sample is that each should serve some definite function. There should be no such thing as activity for activity's sake. Learning experiences without a specific function are a waste of student's time.

Numerous questions which lend themselves to action research arise at this juncture in the curriculum development process. How useful are role playing and simulation activities in altering or reinforcing attitudes? To what extent are mapping activities conducive to developing concepts and generalizations? Are field experiences crucial to the development of data-gathering skills? Are map making activities necessary for developing map using skills? Which media forms provide the best opportunities for acquiring information and analyzing values? Which objectives are best accomplished through individual activities, which require small-group work and which can be achieved through large-group instruction?

Two difficulties commonly occur during this stage of curriculum development. First is the need for minimizing discrepancies between goals and objectives, on the one hand, and content, strategies, and activities, on the other. Such discrepancies could arise if the content is an unsuitable vehicle for obtaining a particular objective. In other instances, any likelihood of obtaining broad curricular goals could be negated by choosing inappropriate teaching strategies or by designing incompatible learning activities. The second difficulty arises when the curriculum developer mistakenly assumes that a particular body of subject matter implies a particular approach to teaching and learning. Within geographic education this mistake most frequently occurs in the context of regional geography. Many teachers charged with developing regional courses seem to believe that such courses must *necessarily* be descriptive and the instructional strategy must *necessarily* be expository; they also seem to believe that such courses cannot be conceptual and that the dominant instructional strategy cannot be inquiry. Obviously such assumptions are erroneous because neither the organizational emphasis nor the strategy emphasis are inherent in any body of subject matter.

The Tyler-Taba Model: Goal Achievement

As Figure 3.2 clearly indicates the major purpose of this final phase of the curriculum development model is evaluation.[28] Simply stated, the basic question to be answered at this point is to what extent have the objectives for the course been realized? This question is deceptively simple for it would be a rare instance where all objectives have met satisfactorily. If this were the case, it would raise questions about the appropriateness of the objectives. In the more common case, several objectives would not have been satisfactorily attained and the curriculum developer needs to reexamine and revise previous decisions about objectives, content, and activities in order to rectify the situation.

Satisfactory completion of the Goal Achievement Stage requires that suitable instruments and techniques be acquired and/or developed to measure achievement, attitudes, skills, opinions, and interaction among students and teachers. However, the fact that the development and teaching of the curriculum is cast in an action research mode puts one in a far better position to assess the impact of particular teachers and groups of students. Furthermore, the application of an action research model to curriculum development creates a situation in which evaluation is constant and ongoing and provides a mechanism for adjustments in the curriculum while it is being developed. This significantly reduces the amount of waiting which normally occurs between the time curriculum decisions are made and the time when they can be objectively assessed.

Conclusion

Courses in geography and the utilization of geographic elements in social studies programs are seen by many to need considerable revision. In most elementary and secondary schools geography does not typically have a "good image." In those areas where geography is popular with and valued by students, it can probably be assumed that quality courses have been tailored to fit the school population and are taught by enthusiastic teachers. Where does this quality and enthusiasm come from? From involvement in national institutes? From the adoption of national curriculum projects? From hard working and dedicated teachers? There are no simple and easy answers to such questions. We have taken the position that action research and the application of a conceptual framework for curriculum development will go a long way toward upgrading current geographic curriculum. The principal benefits to be derived from such an approach would begin with the significantly greater involvement of personnel on the local level which should provide teachers with greater enthusiasm. Another benefit would accrue from the fact that decisions would be made on the basis of objective evidence as opposed to deference to authorities, untested assumptions, and personal preferences. Finally, this approach would create a critical and open mind set toward curriculum development being viewed as a continuous process rather than a task to be completed. This alone should improve the quality of geographic education.

NOTES

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4

Geography in the Social Studies Curriculum

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Close your eyes and imagine yourself back in school. Conjure up the past and think about these questions. What topics did you study? What materials did you use? What were some typical classroom activities? How did your teachers conduct their classes? Did you study geography and learn places and products? Did you study history and learn about explorers and wars? Did you fill in all those empty blanks in the workbook and color in all those places on the maps? Do you remember the "read-recite-review" lessons, the night before the big test when you memorized all these "important" facts, and how right answers were "king?"

If you were to visit your old classrooms today, would things still be the same? In many cases the differences between education of the past and education of the present are negligible. However, changes are taking place and if you did visit your old school, you might witness some very different events. In one classroom children are moving around to a number of pupil-operated donut shops, trying to decide where the best and cheapest donuts can be purchased. In another classroom something tells you that the pupils have been studying business growth in your old hometown because they are getting ready to interview businesspersons about their decision to locate their business in a nearby shopping center rather than downtown. In your old fifth grade classroom the children are comparing American and Eskimo views of death and opining as to which group is more humane.

In what is now called the middle school, the class has just viewed a film vividly depicting the pressing problems of American cities and is now listing on the chalkboard several hypotheses concerning what caused these problems. Subsequently they will divide into interest groups with the task of collecting information regarding these various ideas. In the high school, history and geography are still offered but they make up a smaller portion of the classes from which pupils can choose; courses in economics, sociology, anthropology, psychology, and political science are relatively abundant, as well as courses such as Man and the Environment and Urban Studies.

Multidisciplinary and Interdisciplinary Approaches to the Curriculum

One could leave today's schools asking many questions, including "Whatever happened to geography?" If the teachers in the classrooms visited were asked this question, they might answer:

Teacher A: We just don't have time to study geography anymore. By the time we've taught the basic reading and mathematics skills, there isn't time for much of anything else. Now we're expected to teach also environmental education, career education, consumer education, you name it! Now how could I possibly have classes in geography?

Teacher B: Books just aren't like they used to be. It used to be you could order good geography books for elementary school children, but now about all you can get are books dealing with *all* of the social sciences.

Teacher C: Our curriculum guide states that we shouldn't teach just the facts of geography. Now we should be examining basic concepts of the social sciences. If we are studying the basic concept of "interdependence," then we should select examples from the social science disciplines that best illustrate that concept. If geography can do that, use it; if it can't, use a different social science!

Teacher D: Last summer my professor said that facts from the social sciences had no transfer value. She said that we should be teaching only those facts which were applicable to the main idea or "generalization" we were trying to get across. So much of geography is factual; now I teach geography only when it relates to some "big" idea.

Teacher E: If social studies is to be interesting to pupils we should be teaching about topics and problems that are of concern to our students. My children have a hard time seeing how geography relates to problems of today. If geography can help children understand a problem, I'll use it. Never again will we memorize capitals, products, major cities, and so on.

Teacher F: It's not the job of those of us in pre-collegiate education to be training geographers. That can be done at the college and university level. Our task is that of teaching children to think intelligently about personal and public social problems. Most of these problems cut across several social science disciplines. If we were to teach the social sciences separately, students would have a hard time seeing the relationships between the disciplines.

Although many would take exception to some of these responses, they are points of view from the world of the classroom and illustrate that educators are continually searching for new and better approaches to the curriculum. One major result of this search has been the widespread acceptance and adoption of the multidisciplinary and interdisciplinary curricular organization. While both of these approaches are based on the assumption that all social sciences, including geography, can make a contribution to the social studies curriculum, each reflects a different approach to the selection and organization of subject matter.

We can illustrate this difference by examining two third-grade textbooks, one utilizing a multidisciplinary approach, the other an interdisciplinary approach. The multidisciplinary approach is used in *Metropolitan Studies*, published by Scott, Foresman and Company.[1] Units of the book are:

Unit 1: People in Metropolitan Areas
    What is a city?
    What is a metropolitan area?
Unit 2: Physical Geography
    Where are cities located on earth?
    Why are metropolitan areas located where they are?
Unit 3: Human Geography
    Where do men build cities?
    How do people in cities use resources?
    How do metropolitan areas grow?
Unit 4: Economics
    How are goods and services produced?
    How do people in metropolitan areas get the things they want?
Unit 5: Political Science
    Why are city governments needed?
    How are metropolitan communities governed?
Unit 6: Anthropology and Sociology
    What groups are found in metropolitan areas?
    How do groups change urban areas?
Unit 7: History
    What is history?
    How do metropolitan communities grow and change?
Unit 8: Foreign Studies/Kenya and Japan
    Are there large cities throughout the world?
    Are there more urban areas in some parts of the world than in others?

The interdisciplinary approach was selected by Silver-Burdett Company for their third-level book, *People Use the Earth*.[2] Units One and Two, "Problems of Using Natural Resources" and "Problems of Conserving Natural Resources," include the study of several communities in the United States and other countries of the world. The focus of Unit Three is "Problems of Cities." Components of that unit are:

1. Cities Depend on Natural Resources
2. Cleaner Air for Atlanta
3. Traffic in Our Nation's Capital
4. Services for the People of Mexico City
5. St. Louis—A Changing City

The fact that both programs focus on cities permits a comparison of the multidisciplinary approach and the interdisciplinary approach to the same topic. The text utilizing the multidisciplinary approach highlights one of the social sciences for each of the units of the study while the interdisciplinary text organizes units around problems and then uses content from the various social sciences for each problem to be studied. The multidisciplinary approach is organized in such a way that each topic, or problem, is joined rather clearly with a social science and each of the major social sciences is emphasized at only one point in the program. Interdisciplinary approaches are also structured around topics and problems, but several, or perhaps all, disciplines are brought to bear on a particular topic or problem; content and methodology from all the social sciences are used throughout the entire program. The interdisciplinary approach promotes a curriculum structure in which the interrelationships of disciplines can be more intensively explored.

Some social scientists, including many geographers and historians, view both approaches as diluted social science and are perplexed by their "loss of identity" in the curriculum. On the other hand, many sociologists, economists, and anthropologists are likely to see multidisciplinary and interdisciplinary approaches more positively because content from their once-neglected disciplines is now being included in the curriculum. However, whether "loss of disciplinary identity" and inclusion of all social sciences is good or bad is a moot question because the fact of the matter is that single disciplines no longer dominate the pre-collegiate social science/social studies area of the curriculum. Therefore, we believe that geographic educators should direct their efforts toward a concentrated study of how their discipline can make its strongest contribution to multidisciplinary and interdisciplinary curriculum. How can geography be integrated into contemporary social science/social studies programs in ways that will preserve its integrity and at the same time make useful and significant contributions to the education of children? The remainder of this chapter is focused on that question.

Guidelines for Social Studies Programs

In this section some guidelines are presented for multidisciplinary and interdisciplinary social studies programs. These guidelines are neither stringent criteria nor innovative pronouncements; instead, the authors regard them as desirable directions for social studies programs and acknowledge what many have stated before. It is believed, however, that the quality of both geographic and social studies education would be improved if they were heeded and applied. Later, some practical examples will be provided of ways in which geography could be integrated with the social studies curriculum in accordance with these guidelines.

Each Discipline Should Be Called Upon to Do What It Can Do Best

Geography, like most other social science disciplines, can be related in one way or another to almost any topic of study, but should it be? The authors believe education is weakened by deliberate efforts to "drag in" content which does not make a strong and serious contribution to the topic or problem being studied; hence, geography should contribute to a study only when it adds an idea, a point of view, or a method of analysis which other disciplines cannot provide. But what can geography do *best*?

Most social studies curricula have as their theme people's interaction with their physical and cultural worlds. What can geography offer to such studies? An initial response might be that geography is the social science most concerned with study and description of the physical environment of people. Since human activity occurs in time and place, geography obviously can help students understand the nature of places. But place must not be interpreted to include only what has come to be known as "place geography," i.e., the acquisition of descriptive information about numerous points on the surface of the earth. Geographic concepts such as site, situation, scale, distribution, areal association, spatial interaction, and region are useful tools for examining the nature of places.[3]

Any effort to identify and use what geography can do best will probably omit many special interests of geographers. The point being made here is that geography can do many things but some things may be done better by using content and methodologies from other social sciences. In multidisciplinary and interdisciplinary curricula it may well be that less time will be spent teaching and studying geography than ever before; the challenge is to make the educational experience the very best of which we are capable.

Content Outcomes and Process Outcomes Should Be Considered Equally Important

For many years the acquisition of vast amounts of content was the paramount goal for social studies education. In recent years much criticism has been leveled at content acquisition as the foremost goal of education and the emphasis has shifted toward a major concern for development of students' thinking processes. We think it is unfortunate that content and process have been dichotomized for one is of little importance without the other. On the one hand, children are often asked to learn important ideas apart from the scientific processes and purposes which produced those ideas; consequently the real meaning of those cannot be comprehended. On the other hand, children are frequently exposed to process-oriented activities having no real substance; so much stress is placed on the activity that content outcomes are never really achieved.

Perhaps the trend toward the formulation of behaviorally stated instructional objectives will alleviate this unnecessary and unproductive separation of content and process. Most proponents of behaviorally stated objectives contend that a behavioral objective should include both the content to be learned and the thinking process to be utilized in the learning of that content. To the extent that they help teachers blend content and process, behavioral objectives will serve a very worthwhile cause.

Pupils Should Be Actively Involved in the Learning Process

Many of the things teachers do in classrooms simply do not "turn kids on." It may well be that some content is not particularly interesting, but is this because of something inherent to that content or is it because of the way we deal with that content? All teaching-learning activities need not be fun or entertaining, but teachers must attempt to relate what they are teaching to the world in which the students live.

An often quoted saying well illustrates the need to create situations in which pupils can learn by doing; "I hear and I forget; I see and I remember; I do and I understand." Classroom instruction must provide opportunities for students to be actively engaged in their own learning. The need to have students actively involved in the learning process indicates a preference for direct, first-hand experiences. Such techniques as field study, simulations, and interviewing can involve pupils in their learning and at the same time lead to sound geographic learning. In addition, students must work directly and intimately with problems of society, methods of inquiry, modes of conflict resolution and systems of values if they are to learn about such topics.

Instruction Should Be Conducted In Accord With Known Principles of Learning

Theories of learning have been delineated by scholars such as Jerome Bruner, Jean Piaget, and Lawrence Kohlberg. While each theory has elements of uniqueness, each theorist would likely agree on several general principles of learning. To research each of these theories diligently and then apply the most appropriate to classroom instruction is probably more than should be expected of most classroom teachers. The authors propose that social studies instruction would be vastly improved if every teacher made serious attempts to implement only a few general principles of learning such as those suggested by Gardner and Rogers:

1. Social studies content is learned best when presented in meaningful contexts.
    a. A meaningful context is one in which the student is stimulated to react to whatever content he is studying.
    b. A meaningful context is one in which new learning is related to concrete experience.
2. Learning in the social studies is facilitated by the development of various types of thinking processes. These processes, rather than rote learning, constitute the important social studies goals.
3. Learning is facilitated when topics are taught in depth rather than covered in breadth.
4. Attitudinal learning may be facilitated by careful identification of the specific attitude to be developed and by the construction of situations considered advantageous for attitude change.
5. Learning is facilitated when differences among learners are recognized and attempts are made to teach different pupils differently.
6. Learning is more readily transferred when the learner sees a new situation as essentially similar to a situation with which he is familiar. Teaching method, rather than subject taught, determines what is transferred.[4]

Programs and Teachers Should Maximize the Transfer Value of What Is Taught

Teachers at all levels should be concerned about teaching students to apply previously learned knowledge and methods of inquiry to new situations and problems, or to transfer their learning. Educational psychologists tell us that facts, in and of themselves, have little transfer value, yet much of what has been taught in the name of geography has had a predominant factual orientation. If geographic education is to help students transfer known relationships of various phenomena to new situations, more time must be given to the study of geographic concepts and generalizations having potential transfer value. While a strong factual base is a prerequisite for higher level thinking, we must be more selective in the facts chosen for pupil learning. Much has been accomplished in recent years to move curriculum in this direction, e.g., most textbook publishers and curriculum developers frame their programs around "conceptual frameworks." Moreover, because transfer is essentially a problem of seeing how things relate, the interdisciplinary and multidisciplinary approaches themselves constitute an effort to deal with the problem of transferability. Nonetheless, greater efforts must be made to assure that what is taught and learned in the classroom can and will be applied to the "real world."

The Content and Processes Emphasized in the Curriculum Should Have a Relationship to the Decisions One Must Make in Real Life

Education is concerned with the preparation of a mature, well-informed citizenry capable of making sound and ethical decisions. These range from dealing with simple daily problems to the formulation of long range plans for resolving complex social issues. It is hardly reasonable to expect adults to make well-informed, responsible decisions if as students they are not given opportunities for practice in decision-making processes. The curriculum, whether traditional or modern, abounds with opportunities to develop and use social science concepts and principles in decision-making situations. But how often do we really ask students to practice making such decisions?

Even better, how frequently do we ask students to justify, explain, or defend the few real decisions we do allow them to make? While it may be true that many decision-making activities undertaken in the classrooms are unrealistic because of the students' inability to implement their decisions, e.g., holding mock elections for government candidates when only a small percentage of students are old enough to vote, the classroom does offer a laboratory where the student can practice decision making without having to suffer the harsh consequences of a "poor" choice.

Integrating Geography Into the Secondary School Social Studies Curriculum

In this section several suggestions are provided for integrating geography into the secondary school social studies curriculum in ways that are consistent with the guidelines set forth above and that maintain the disciplinary integrity of geographic ideas. The first example concerns proportional representation, a topic often studied in classes on United States government; the second example involves urban aesthetics, a topic which should arise in high school courses on social problems. By examining the geographic dimensions of proportional representation and urban aesthetics, students should learn important geographic ideas and skills, thus strengthening the secondary school's social studies program.

Proportional Representation

After history, political science is the most widely taught social science discipline in secondary schools.[5] What can geography contribute to the study of politics? One instance arises in the selection of a president where it is obvious that regional origins are taken into consideration when candidates are chosen. Voting records in legislatures often reflect regional and sectional interests and justice itself may be administered differently in different places. Note that political representation itself rests on two principal geographic factors—area and population.

Basically, proportional representation is a scale problem. If one Congressman represents 260,000 people, we might say the ratio of Congressmen to people is 1:260,000; the similarity with map scale is evident where one unit on a map represents many units on the earth. Many states have detailed laws which prescribe how the state shall be divided into congressional districts. The results of legislative attempts at redistricting have frequently been challenged in the courts and charges of "gerrymandering" are sometimes leveled at those charged with creating such districts. Most teachers of United States government will be familiar with the "hassles" over proportional representation, but those without a background in geography may overlook the possibilities of using maps to put over some of the principal ideas and may not perceive the fundamental scale relationship which is involved. Any attempt to draw boundaries is an effort to segregate, and segregations result in spatial patterns; in fact, most political activity displays spatial patterns. It is these patterns and the processes which created them that are the province of geographic inquiry.

Research indicates that students beyond the age of twelve can handle the idea of proportionality and can comprehend the need for proportional representation.[6] High school students are capable of proposing more equitable congressional district boundaries; necessary data are available in census reports. Groups of students working on the problem would undoubtedly devise different plans, and the relative merits of each plan could be debated. Plans with particular merit could be further publicized and simulations may be used to generate interest. Activity 2, "One Man, One Vote" and Activity 3, "School Districts for Millersburg" in Unit 4, *Political Geography*, of the High School Geography Project are examples of highly motivating simulations on this topic.[7]

Urban Aesthetics

The attention being given to urban studies in the schools is reflected in two yearbooks on this subject, *Teaching About Life in the City*[8], the 42nd Yearbook of the National Council for the Social Studies, and *Metropolitan America: Geographic Perspectives and Teaching Strategies*[9], the 1972 Yearbook of the National Council for Geographic Education. Urban studies can be approached from the viewpoint of many social science disciplines, especially sociology and economics. We have narrowed the topic of urban studies to the consideration of urban aesthetics, especially as it relates to the quality of life in urban environments.

What can geography contribute to a study of urban aesthetics? Geographers have long been concerned with the form, or shape, of cities and have related various urban patterns to urban functions. Geographers have also investigated ways in which people perceive their environments; of particular interest has been the urban environment.[10] Because perception entails awareness, involvement, and behavior, one objective of a unit of study on urban aesthetics would be to examine the relationship between the quality of an urban environment and human behavior patterns. For example, what are the factors in urban surroundings which help a person feel good? What factors result in feelings of frustration or ugliness? What are the impacts of amenities such as greenbelts, mini-parks, sign-control laws, bikeways, and new towns? How did the commercial strip develop? Why is one housing project clean, neat, and well landscaped while another is marked by graffiti, is unkempt, and is unsafe at night? What is the process by which urban people can attain pleasant surroundings?

"In what kind of surroundings do you want to live?" This is a central question requiring decision making from everyone. Choices are involved, and these require personal action as well as group action and policy making at higher levels. At the national level, through elected representatives, policies may be implemented which will inhibit further growth of urban areas and foster rural development. At the state level, legislatures may pass laws controlling signs and limiting access to state highways so that roads function again as a means of getting from one place to another. At the local level, shopkeepers may reappraise their storefronts and remove false facades in order to let some of the true character of their establishments become visible. In the schools and the homes, doors may be painted, flowers planted, posters hung, so that the users of these spaces feel a sense of identity and pride in their surroundings.

Once students are sensitized to the aesthetic quality of their environments and their effects on moods and feelings, they are apt to take more active roles in transforming their environments. One such environment is the school. What can be done to improve its aesthetic quality? What about the corridors, the grounds around the school building? What does the appearance of the school signify to the outside world? Does anybody care? Students may also wish to take a good look at their neighborhoods. Many have been turned off by the "keeping up with the Joneses" notion and the shallower aspects of certain social relationships which have characterized some facets of urban life. Some of the favorable aspects, however, such as expressions of individuality in detached homes with gardens, shrubbery, and play areas around them, also need to be observed. Regional planners, land developers, park superintendents, and zoning officials may be useful resource persons for such topics.

A study of urban aesthetics can produce a rather stark and grim picture of social realities. Cheaply built commercial strips and housing developments stand out as the blots on the landscape. Students learn that some people make choices based on the greatest prospect for profit or the least expenditure of effort, rather than on the basis of aesthetics or ethics. But citizens can improve their habitat as part of their individual custodial responsibility toward "Mother Earth"; cities need not be pockmarks on the earth's surface. The ecological principles of harmony and balance appeal to the idealism of youth, and these are implicit in a study of urban aesthetics. For those for whom idealism is fraught with frustration, a glimpse of a potential model, or a grasp on an urban environmental principle, may not only capture their attention, but may also be incorporated into their ethical system.

Some Models for Integrating Geography into the Elementary School Social Studies Curriculum

A widely utilized topic of study for elementary school social studies is the home community. Gross points out, "In many respects the home community is the most important of all geographic regions. It should be the base of operations in geographic learning at all geographic levels."[11] Emphasis is usually given to this topic during the primary level years. Most major commercial publishers of elementary school social studies textbooks devote at least one year of study at some time during the primary years experience to "communities." A sampling of primary school textbook titles illustrates the relative importance placed on the study of communities in modern social studies programs: *We Live in Communities*[12], *Metropolitan Studies*[13], *Inquiring about Communities*[14], *Communities and Their Needs*[15]. Such textbooks with nationwide distribution must necessarily select certain cities to serve as case studies, and it is left to the individual teacher to initiate study of the home community by constantly comparing and contrasting it with the case study communities of the textbook. All too often, however, what actually happens is that the home community is never studied.

But why should the home communities be studied? Gross suggests a number of reasons:

1. Studying the home community permits direct observation of natural, cultural, and social phenomena; for primary learning, experiences are basic in the educational process. Children learn best by having direct contact with the things they are learning about.
2. The home community provides an identification and interpretation of relationships of observed phenomena. Perhaps no other skill in geography is as difficult as the interpretations of man-landscape relationships. The community serves as the best laboratory in which to acquire that skill.
3. Home community study permits an insight into the complexity of human affairs and the intricate relationships involved in the process of social living.
4. The home community furnishes real-life situations. Fundamental concepts can be developed on the basis of things actually seen or heard or smelled or tasted or touched.
5. Studying the home community encourages intelligent interpretation of maps. If a map is, at times, to serve as a window through which one sees the landscape, it is desirable to have maps and make maps of observed landscapes. Possibly it can be assumed, if a pupil has had considerable exercise in making and studying maps of known landscapes, that ultimately a map of a remote region will in itself provide some reasonably accurate visual imagery.
6. The home community equips the child with a fund of knowledge which may be used in the development of mental imagery of far away things.
7. Studying the home community provides a basis for the comparative evaluation of communities. In making an analysis of likenesses and differences of communities, the place with which the pupil is intimately acquainted is quite naturally the core consideration in comparative evaluation.
8. The home community is the primary place where good citizenship can and should be practiced. It is here where the first fundamental steps in citizenship training are taken. The biggest problems in life for any citizen are within the visible landscape.
9. Home community study contributes to better school-community relationships. The school develops greater interest in the community, and the community shows greater concern for the school.

10. Studying the home community encourages the use of a systematic method of study. Various steps ranging from exploratory observation to the application of new understandings are involved.[16]

The models presented in this section demonstrate some ways in which teachers in the primary grades can deal with a study of their community and the role geography can play in such a study. Case studies are organized around the interdisciplinary concepts of needs and change. Two practical teaching examples will be described for each concept.

Case Study 1: Geographic Dimensions of People's Need for Food

In recent years the learning center has gained widespread acceptance as a teaching tool for the elementary grades.[17] Unlike the traditional interest center, the learning center is a collection of activities and materials specifically structured to teach particular skills, concepts, generalizations, or values. The learning center utilized for this case study is used in a primary grades study of the generalization, "People need food." The center activities are designed to focus on the subgeneralization, "Our food comes from different areas of the United States and different areas of the world."

Learning centers purposely contain many open-ended activities. The teacher is left free to make the decision as to which activities are to be done by individuals and which by groups. Many activities have no "right" answers but allow for several possible answers. The skills of reading, locating, researching, listening, creating, choosing, and hypothesizing are among the many process elements built into center activities. It should be noted that the learning center is not the only form of instruction children should receive; complementary class and small group lessons should be conducted.

Before children begin working, the teacher would introduce the center to the class, explaining carefully the directions for each activity. She would explain which activities have prerequisites; for example, Activities One and Two should be completed before beginning Activity Three. Children would be told they will be allowed to get materials they need from the classroom supply cabinets if they are not provided at the center. Needed references and resources are located near the center. Several books about foods and life in other countries are at the center even though they are not specifically required in order to successfully complete the learning tasks. Figure 4.1 illustrates what the learning center might look like when it is first introduced to the children.

Activity One

Objective: Students will use names of cities, states, and countries to differentiate between foods processed in the United States and foods processed in another country of the world.

The teacher prepares the activity by placing in the learning center a shopping bag full of containers which once held food items produced in various states and nations. She has chosen food containers that have the name of the processing site clearly identified on a label or the container itself. In some cases the place named on the label is not near the geographic area in which the food is grown; this will be discovered by pupils in

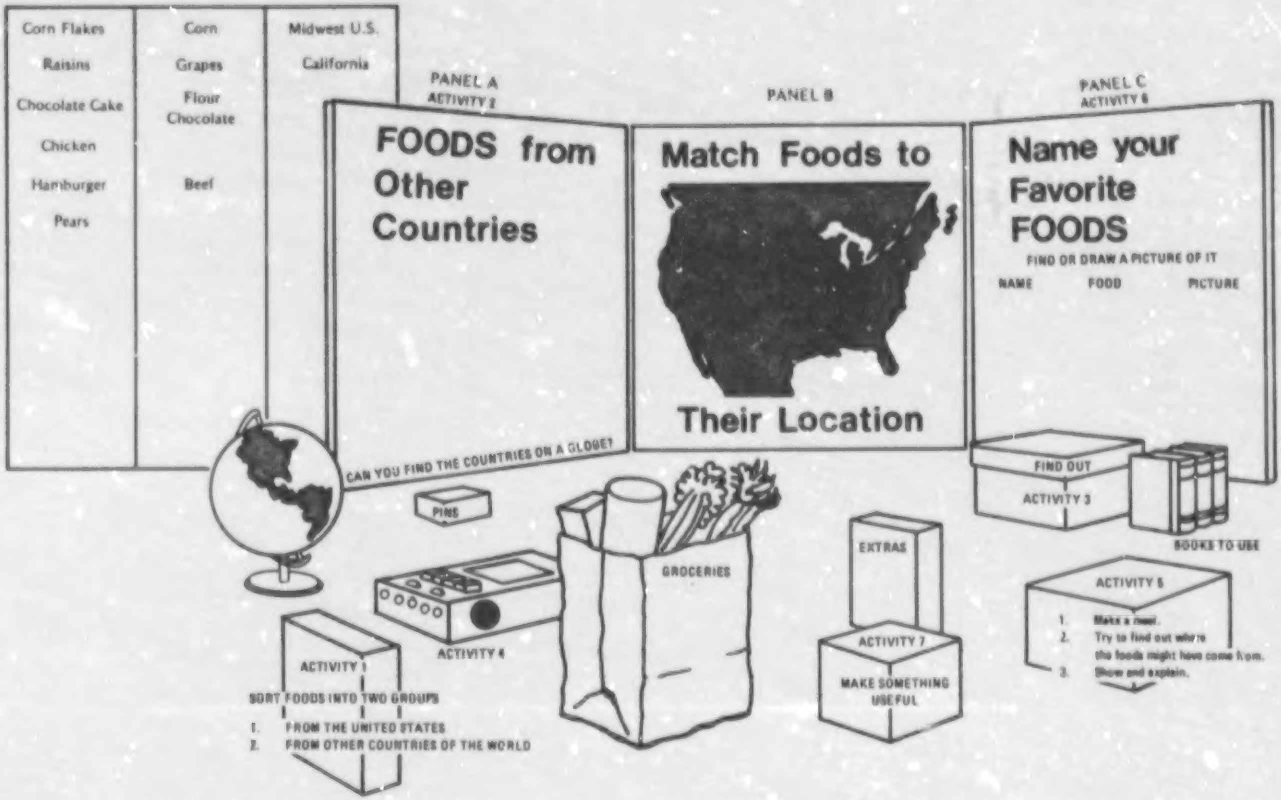

Corn Flakes
Raisins
Chocolate Cake
Chicken
Hamburger
Pears
Corn
Grapes
Flour
Chocolate
Beef
Midwest U.S.
California
PANEL A
ACTIVITY 2
FOODS from Other Countries
CAN YOU FIND THE COUNTRIES ON A GLOBE?
PANEL B
Match Foods to Their Location
PANEL C
ACTIVITY 6
Name your Favorite FOODS
FIND OR DRAW A PICTURE OF IT
NAME
FOOD
PICTURE
FIND OUT
ACTIVITY 3
BOOKS TO USE
PINS
ACTIVITY 4
GROCERIES
EXTRAS
ACTIVITY 7
MAKE SOMETHING USEFUL
ACTIVITY 1
SORT FOODS INTO TWO GROUPS
1. FROM THE UNITED STATES
2. FROM OTHER COUNTRIES OF THE WORLD
ACTIVITY 5
1. Make a meal.
2. Try to find out where the foods might have come from.
3. Show and explain.

Figure 4.1. A learning center.

a later activity. Students are instructed to find the name of the state or nation on each label. They then are to classify foods as to whether they were processed in the United States or another nation of the world. Children are encouraged to bring to class empty cans, bottles, and boxes that once contained food produced in other countries. These can be added to the grocery bag.

Activity Two

Objective: Students will locate on appropriate maps or a globe cities, states, or nations in which food items were grown or processed.

Children recheck labels to identify containers of foods processed in the United States. Once the site of production or processing is identified, pupils put the food container on the table in front of Panel B and connect the container with the approximate location on the United States map with a piece of colored yarn. Food containers that once held an item processed in another country of the world can be taped or pinned to Panel A of the learning center. As students place items on Panel A they find the appropriate country on the globe.

Activity Three

Objective: Students will locate information about foods and where they are grown or produced.

In the matching process of previous activities, children have connected food containers with processing sites or the sites of company headquarters. (In some cases, however, food labels will read "Grown in ________.") To point out that some foods are not grown or produced near the city or country named on the container, the teacher has prepared simple information-seeking cards which are placed in the "Find Out" Box. Pupils use their dictionaries, encyclopedias, social studies books, and other available books to collect the data needed for foods that have been considered at the learning center. Sample research cards are shown in Figure 4.2.

After finding the information, the pupil transfers it to large data charts hung on

Food:
Made from:
Where grown:
Is it grown near the place it is processed?________

Food: Raisins
Made from: Grapes
Where grown: California
Is it grown near the place it is processed?___Yes___

Figure 4.2. Sample research cards.

the wall near the learning center. The teacher has already started the chart with information on some of the foods that had originally been placed in the grocery bag (Activity One). As pupils add data to the chart the teacher makes sure they understand that the place of processing is not always near the geographic area in which the food is grown or produced. As time allows, the teacher asks questions such as, "Why do you suppose that coffee is grown in Colombia and Central America but is processed in the United States?" Through this activity children should learn that some of the foods they think are grown in the United States may actually have come from other countries of the world.

Activity Four

Objective: Students will listen to a tape recorded interview with a local grocery store owner and answer questions based on the interview.

The teacher has recorded a carefully planned interview with a local grocer. Children first listen to the recorded interview. Then they use this information to answer questions on the worksheet (Fig. 4.3).

Listen to a Grocer

1. Name two foods grown in your state. ______________________ ______________________
2. Write the names of two foods grown in another state. ______________________ ______________________
3. How do most foods get to the grocery store? Circle the answer.

   airplanes trucks cars
4. Why do some foods have to be kept cold while others do not?

Figure 4.3. Sample worksheet.

Activity Five

Objective: Students will plan a meal and then determine the source and possible geographic areas of growth or production of the various foods selected for the meal.

A cardboard box with pictures of many different items of food cut from magazines, newspapers, and other sources is provided at the learning center. Students look through the pictures and plan one meal. The food items selected for the meal are then glued to a paper plate. Once the meal has been planned students are encouraged to find out where the various foods came from. They will use charts, "find out" cards, books, and encyclopedias in the center to determine possible geographic sources for the foods. They will then show their meal to one or more classmates and explain the sources of the foods.

Activity Six

Objective: Students will name their favorite food and find or draw a picture of it.

Students choose their favorite food and find or draw a picture of it. These items of information are then written and pinned on Panel C of the learning center. After all students have added their data to the chart, the teacher might wish to ask:

1. Did everyone pick the same food as their favorite?
2. What does the chart tell us about people and the food they like best?
3. What do you think would happen if we made a class chart of the foods liked least by each person?
4. If we asked a class of children in Japan (or any other country) to make a list of their favorite foods, do you think their list would be like our list? Why or why not? Where could we find out what foods children of other countries like?

Activity Seven

Objective: Students will create something useful from an empty food container.

Most packaging for food products ends up as trash and waste. In this activity students are to take one of the empty food packages found in the cardboard box marked Activity Seven and convert it into something useful for their desk, school room, or home.

Extras

A number of other activities are available in the center for those who wish to do further study. Directions for each activity are written on sheets of colored construction paper. Included in the activities are:

Make an ad to get others to buy a certain food.

Ask your mother or father what has happened to the cost of food in the last year.

Find out what happens to most food packages after the food has been eaten.

Group some food packages according to what they had in them. Group the food packages according to a rule of your own.

What do you think would happen in grocery stores if all the truck drivers in the United States quit working for one month?

Make up your own activity. Share it with someone else.

Case Study 2: Geographic Dimensions of Man's Need for Recreation

A study of the recreational areas of the community might begin with a consideration of the outdoor games the children play and where they play them. The teacher begins by asking, "What are some of the outdoor games you play?" As children volunteer answers, a large data retrieval chart showing the games and the location of their play is compiled (Fig. 4.4).

Outdoor Games We Play	Where We Play Them

Figure 4.4. Data retrieval chart.

After all children who wish to respond have done so, the teacher reviews the information on the chart and asks, "Why do you play those games where you do?" and later, "What could we say about the places where we play?" Eventually, the children should be able to make such generalizations as, "The place you play depends on the game you're playing," "We play at different places," or "You need more room for some games than you need for others."

If community parks or play areas have been noted in the data retrieval chart, the class would locate the areas set aside for recreational purposes on a large map of the community. Each site is marked with a large colored circle made of construction paper. If the children did not mention parks in their original discussion, the teacher will need to ask the focusing question, "Has our community set aside any areas for play or recreation?" With the park areas now designated by circles, the map is displayed in an area of the room where it is clearly visible to all.

Next the teacher explains to the children that for voting purposes most communities are divided into areas. Many children may be aware of just where it is that their parents go to vote and the name for these areas is given (districts, wards, precincts, etc.). As the children watch, the teacher marks off these areas on the large community map. Now the map illustrates two geographic phenomena, the location of community parks and voting wards. The children are then asked, "How many parks are in each of the voting areas?" A tally of the number of parks in each area is placed on the chalkboard. The children then consider the questions:

1. Which area has the most parks?
2. Are there any areas that do not have parks?
3. Why might some areas have more parks than others?

Responses to the last question should move the class to a consideration of the number of people living in the various areas. Knowing that this would be one variable, the teacher has already collected population information for each of the areas. The figure for each area is displayed beside that area's location on the map. (Information on voting wards and population figures can be obtained from local government offices.) Of course, factors other than population enter into the decision-making process of where parks are built, but at the primary grades level the population factor is one variable that children will be able to understand. If class members bring up other variables such as socioeconomic factors, influential businessmen or councilmen, the teacher should help the class explore those ideas too; the major focus of the lesson, however, is on the population.

With the students now armed with district divisions and population figures for the districts or wards under study, the teacher is ready to present the following hypothetical situation. First, the class is told, "In looking over the amount of money that can be spent in various ways to improve the community, the city council has decided that there will be enough money to provide one more park or recreation area for the community this year." The class then becomes the city council and the teacher asks, "If we have enough money to provide another park, what are some of the first decisions we will have to make?" The class realizes that several questions must be answered and decides to tackle first the question of where the park will be located. They return to the population figures for the various voting wards or districts and, as a decision-making body, vote on the district that should be given the new park. The class is asked to justify its decision. This justification may be based on population or any combination of other variables discussed earlier; now the teacher's role is that of questioning and probing to be sure that the location decision is made on a logically defensible basis.

Once a general location has been selected, the teacher can proceed in two different ways. One option for the teacher is to choose the parcel of land with a specific location and dimensions. In this case, the class should be taken outside where they can measure a piece of land similar to the size of the land parcel with which they will be working. Another option is to have the class decide on a specific location within the district. If the second option is taken, the class will need some kind of "picture" of the district; therefore, the teacher will have obtained air photos and topographic maps of the district to have the park.[18] From these, the class selects a parcel of land that could be used for a park. The teacher decides to take the class on a study trip so they can see the exact space they would be working with.

Now that a piece of land has been selected, the children move on to a consideration of what they would do with the land to make it into a park. The class is divided into smaller groups, each group having the task of developing some ideas about how they want the park to look and what they want to put in the park. To aid the groups the teacher could provide them with catalogues obtained from a local nursery that illustrate different flowers, shrubs, and trees, and catalogues, perhaps borrowed from the principal's office, for play equipment. As each group makes decisions concerning what they will do with the plot of land, they are encouraged to put their ideas in picture form on a large sheet of butcher paper cut to scale.

Each group is given the opportunity to present their "model" for the park. As they present their models they are encouraged to explain and describe the various elements they have put in the park. The teacher then points out that each group has ideas for a park but that only one park can be built. Which plan would they choose? Are there some elements from several plans they would like to combine? If the class decides to combine ideas from several plans, they then make a final large scale model.

After students have developed a park, the teacher helps the class retrace the different steps they have taken and decisions made. The teacher might then decide to culminate the study by inviting a community official to the classroom to explain how the community decision-making body actually goes about making similar decisions; students are encouraged to compare class decision-making process with the strategy utilized by appropriate community officials. After comparing decision-making strategies, the teacher asks the official to tell the class how much their community spends on parks each year and to explain how that money is spent. The lesson is concluded by asking the class and the visitor to respond to the following question: "Do you believe we should use this money on parks and recreation when there are robberies in the community, many streets need repaving, and so on?"

As the study of recreational areas of the community draws to a close, pupils prepare an opinion sheet they will ask their parents to complete, such as the one in Figure 4.5. After responses are returned, the class will analyze and discuss the results.

Case Study 3: Geographic Dimensions of Changing Transportation

A considerable proportion of the land used in any community is devoted to transportation; for instance, in most large metropolitan centers over 20 percent of the land area is used for transportation and transportation-related functions. The people of the United States demand and expect efficient transportation systems as well as greater comfort and convenience, which in turn affect the choice of residence and mode of travel. As the communities grow, their transportation networks change. New highways are built, airport facilities are improved or relocated, and rail service is phased out or renovated. Transportation linkages with other communities of the region, nation, and world can, therefore, be studied as dynamic elements of the environment which are constantly changing to meet the needs of the community. This series of activities is designed to build an awareness in young children of ways in which a community's transportation network can change, as well as ways in which changes in transportation can bring about other changes in the community.

Dear Parents,

We have been learning about how a community meets its needs. We know that a community spends its tax money on several things. Below is a listing of some of those things. Place the numbers 1 through 5 in the space to the left of these items to illustrate the relative importance of these things to you and your family.

______ Sanitation

______ Roads

______ Parks

______ Police

______ Fire Protection

Sincerely,
Third Grade Class of
Alps Road School

Figure 4.5. Sample opinion sheet to be sent to parents.

Activity One

The students look at Photograph 1, an aerial photograph of an urban area taken before a major transportation change (Fig. 4.6). The teacher focuses students' attention on the photo by asking, "What things do you see in this picture?" After students have identified elements of the area, the teacher asks them to describe the area by asking such questions as, "Are there many houses?" "Are the houses close to each other?" "How many roads do you see?" "How would you describe the pattern of roads?" After answering the descriptive questions regarding key elements of the photo, the students are presented with questions that require inferential thinking. For example, "Where would you say this picture was taken, a city or small town?" "What clues in the picture make you think this is a part of a city?"

Activity Two

The teacher tells students that the city in Photograph 1 is Atlanta, Georgia, and that the city has decided to build a superhighway through that part of the city pictured in the photograph. The class is to decide where they think the new superhighway will or should be located. As alternative routes are identified, the teacher probes for consequences of the decision by asking such questions as, "If the highway is built there, how might that area be different after the highway is completed?" "What will happen to the houses?"

Students are then shown Photograph 2 (Fig. 4.7). This photograph shows where

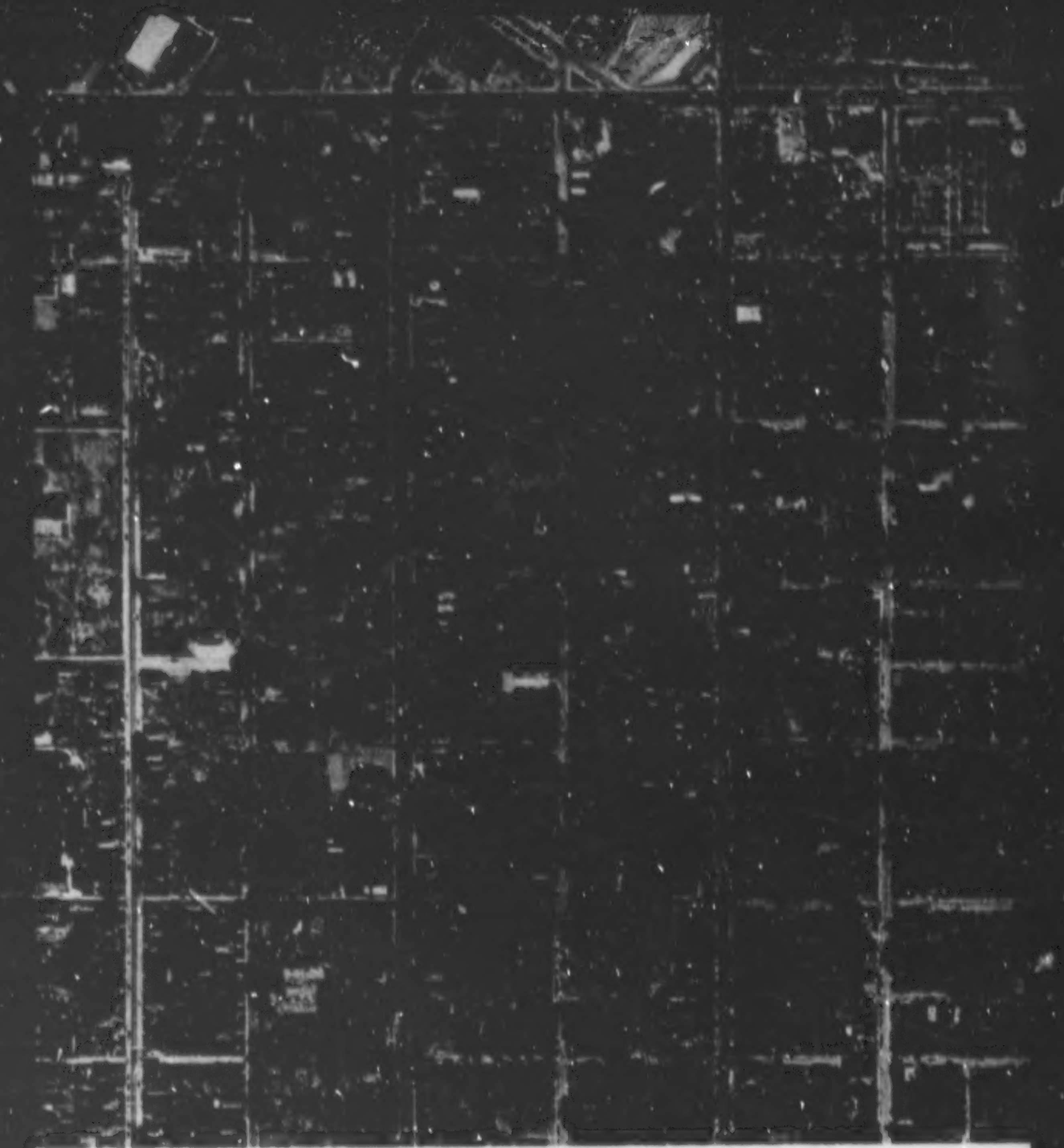


Figure 4.6. Photograph 1: A portion of Atlanta, Georgia, 1955.

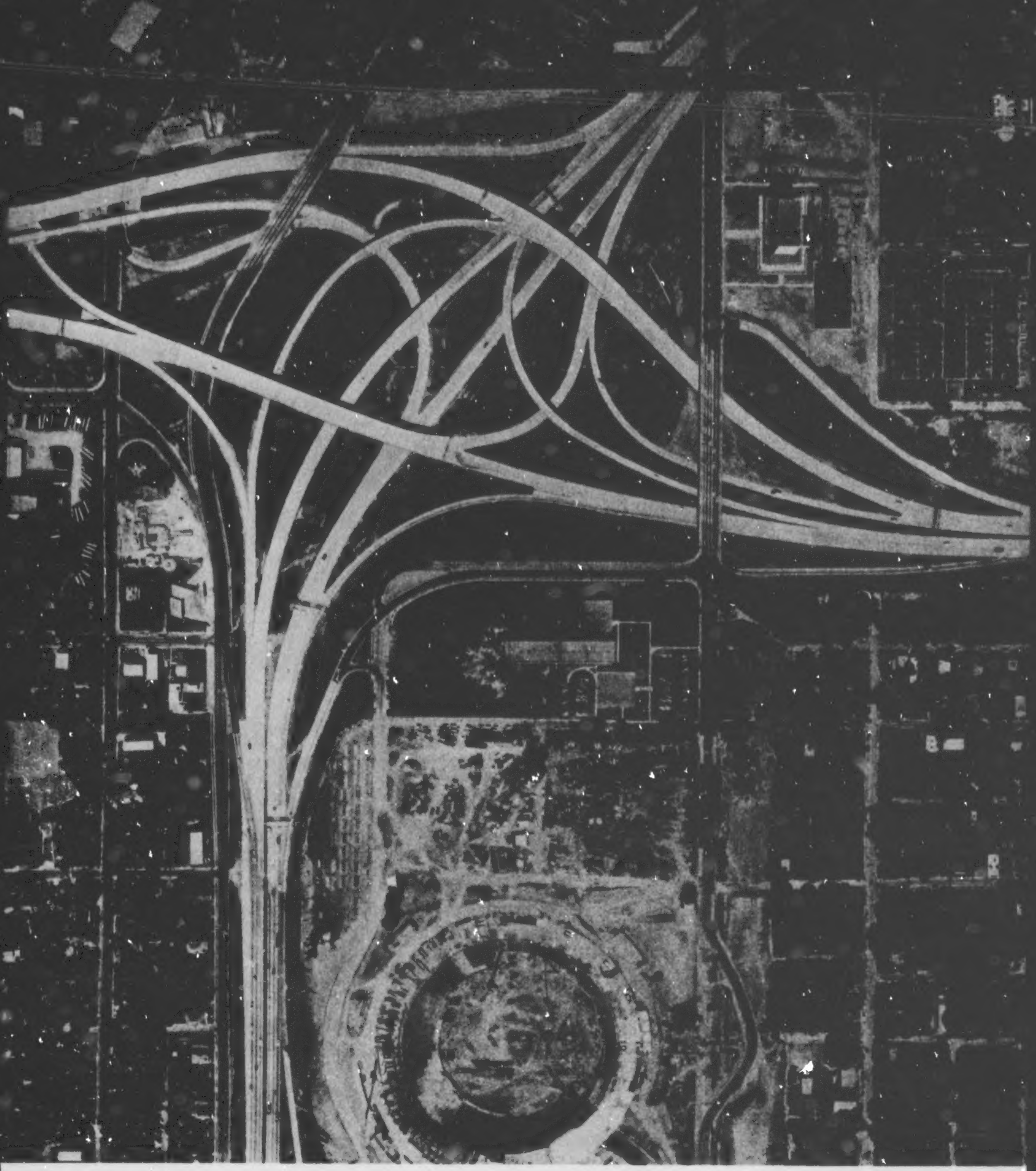


Figure 4.7. Photograph 2: Same portion of Atlanta, Georgia, about 1965.

the superhighway was constructed. Students are now looking for changes that have taken place since Photograph 1 was taken. The teacher helps the children link the two phenomena, the building of the superhighway and the changes that have transpired, and also introduces some "why" questions. For example, the teacher asks the class, "Why do you suppose the new large structure (a stadium) was built near the new highway?" As changes in the environment are noted, a chart depicting changes and possible reasons for those changes is developed as a total class effort (Fig. 4.8).

Changes	Possible Reasons for Changes

Figure 4.8. Chart for recording changes and possible reasons for changes.

Activity Three

Students take a study tour along a road near the school. Upon returning to the classroom, they construct a chart of the many things they saw along or near the road. Then they consider the question, "What might happen to this area if it were decided that the road would be widened or changed into a superhighway?" As different consequences are suggested, the teacher helps pupils analyze the consequences by asking such questions as, "You have said that some of the homes and small stores near the road would have to be moved or torn down to make room for the wider highway. What will the people who live in these houses do for a shelter?" "How will the people who own and work in the stores near the road make a living if those stores are destroyed?"

Activity Four

Unless actual construction of a road is going on near the school, teachers will be unable to present a first-hand experience to illustrate that changes will occur as a result of road building. The next best thing may be to invite a resource person to talk to the class and answer questions. The teacher might choose someone who has been a resident of the community for a long period of time and who has lived in a part of the city that has undergone a great change, such as the four-laning of a street that previously had carried very little traffic. As preparation for the upcoming visit, the teacher and class might arrange a study trip to the area the visitor will be describing. Prior to the visit the teacher prepares the class by giving them the resource person's background. The class formulates questions which they feel would be fruitful to explore with the visitor. A list of questions is made on a large sheet of chart paper and room is left on the chart for the responses. These questions help the teacher be specific in delineating the objectives of the study and of the visit to the resource person. In this way, what is expected will be known in advance and the visitor will be better able to focus on the precise purpose or objectives of the visit.

The class elects to make a tape recording of the presentation and the follow-up question and answer period. After the visit the class will return to the chart of questions and complete the information display with data provided by the resource person. If students have a hard time remembering points of information or if disagreements occur, the class can replay the taped presentation.

Activity Five

In this activity pupils conduct individual and/or group studies of other transportation changes which have occurred, or are presently occurring, in their community. A bulletin board is set aside for the display of articles clipped from local newspapers describing present or proposed transportation network changes in the community. Several pupils bring articles on other changes in the community, but this does not upset the teacher for the concept guiding the study was "change." In fact, the teacher is pleased, for this may indicate that children are able to transfer what they have learned about transportation change to a variety of other kinds of change in the community. However, whenever possible, the teacher relates these other changes to transportation in the community. For example, "If a large new apartment complex is built on the outskirts of the community, what might happen to roads in this part of the community?"

Case Study 4: Geographic Dimensions of Changing Land Uses

In most communities the ways in which urban land is used constantly changes. As adults our experience verifies the fact that the use man makes of a piece of land can change almost overnight. What was once a vacant lot can be transformed into a park, business, or the site of a new home in amazingly little time. While a building still may be used for business purposes, what was a shoe store last week may be a book store in a few days or weeks. Young children, however, do not have this great backlog of experiences. This series of activities helps children examine the use of land and buildings in their community, some ways in which those uses change, and some consequences of those changes. Students learn that:

1. The use of land can change over time.
2. Land is used for several purposes.
3. Buildings can serve different functions over time.

4. Man's use of buildings can affect the aesthetic appearance of a community.
5. Many communities are making efforts to renovate older buildings.
6. People can make contributions to the aesthetic quality of a community.

Activity One

Begin by considering the questions:

"How long has our school building been standing on this piece of land?" "How might we find the answer to this question?"

"What was on the land before the school was built?" "How could we find this answer?"

"What will be standing here fifty years from now?" "How can we find this answer?"

From an examination of these questions, students should come to realize that (1) man builds things on the land; (2) one thing built on the land of a community is schools or educational facilities; and (3) the use man makes of a piece of land can change over time. The teacher concludes this phase of the study by extending the idea that man builds things on the land. The teacher asks, "We know that man builds schools on land. What are some other uses people make of land?" The activity concludes with a class listing of pupil comments. With the aid of probing questions, a typical list might include stores, roads, houses, farms, parks, office buildings, and hospitals.

Activity Two

The teacher focuses on buildings used for business purposes, especially for selling things. Students are asked to recall trips to a shopping center or the downtown business district. "What are the names of some of the stores or businesses you've seen or been in?" "What did they sell or do in those stores?" As children respond, a data chart is compiled which includes the names of stores and what they sell, such as the one in Figure 4.9.

After several businesses (representative of the variety found in the community) are listed, the teacher asks the class, "Which stores (businesses) could we group together because they are alike in the kinds of things they sell?" Pupils formulate groups and justify putting certain businesses in certain groupings. The teacher then asks the class to think of names or labels for the groups and to explain why those names or labels are appropriate for the member businesses of each grouping. Groupings and labels might include:

1. Clothing
2. Food
3. Automobiles, automobile accessories
4. Entertainment
5. Services (barber shops, banks, repairs, etc.)
6. Variety stores
7. Department stores

Name of Store	What Is Sold
Morrison's Cafeteria	Food
Penney's	Clothing, appliances, etc.
Maxwell's	Furniture
Barnett's Book Store	Books, papers, magazines
Davison's	Clothing, appliances, books, furniture, etc.
Lamar Lewis	Shoes
Gunn's	Men's clothing
Foster's Jewelry	Jewelry, gift items

Figure 4.9. Data chart.

Activity Three

The teacher divides a large piece of cardboard into several columns and places the group labels established in the previous activity as the headings of the columns. The teacher arranges a tour of part of the downtown shopping area or a fairly large shopping center. As the children pass businesses they are encouraged to look at the name of the store and to figure out what the store sells by using such clues as the store name, window advertisements, and displays. The students classify each store using their classification scheme and write the names of stores in appropriate columns. If pupils have difficulty classifying a business, they write the name of the business on a separate sheet of paper. (When children later return to the classroom they may revise their classification system in such a way that stores difficult to classify during the walking tour can be more easily placed in appropriate groups.)

During the walking tour the teacher has the class pay special attention to vacant buildings. If any clues are available, the class determines what business was once located in each vacant building. At the end of the tour the class visits either the offices of the community Chamber of Commerce or the manager of the shopping center. There they find out what businesses were located in vacant buildings. The resource person also can inform them of any plans for new businesses to take over the now vacant spaces.

Activity Four

The students are asked to recall buildings that once housed businesses but are now vacant. The discussion centers on vacant buildings, particularly those that were in a state of disrepair. The class considers the questions, "What do you think a visitor to our community might think if he saw these buildings in our shopping areas?" "Are buildings that look like this 'good' for the image of the community?" A pair of "before and after" photographs illustrating a fairly dramatic change in the use of some building(s) in their community is then shown. (Figs. 4.10 and 4.11, Photographs 3 and 4. Similar photographs can frequently be obtained for the home community.) Em-

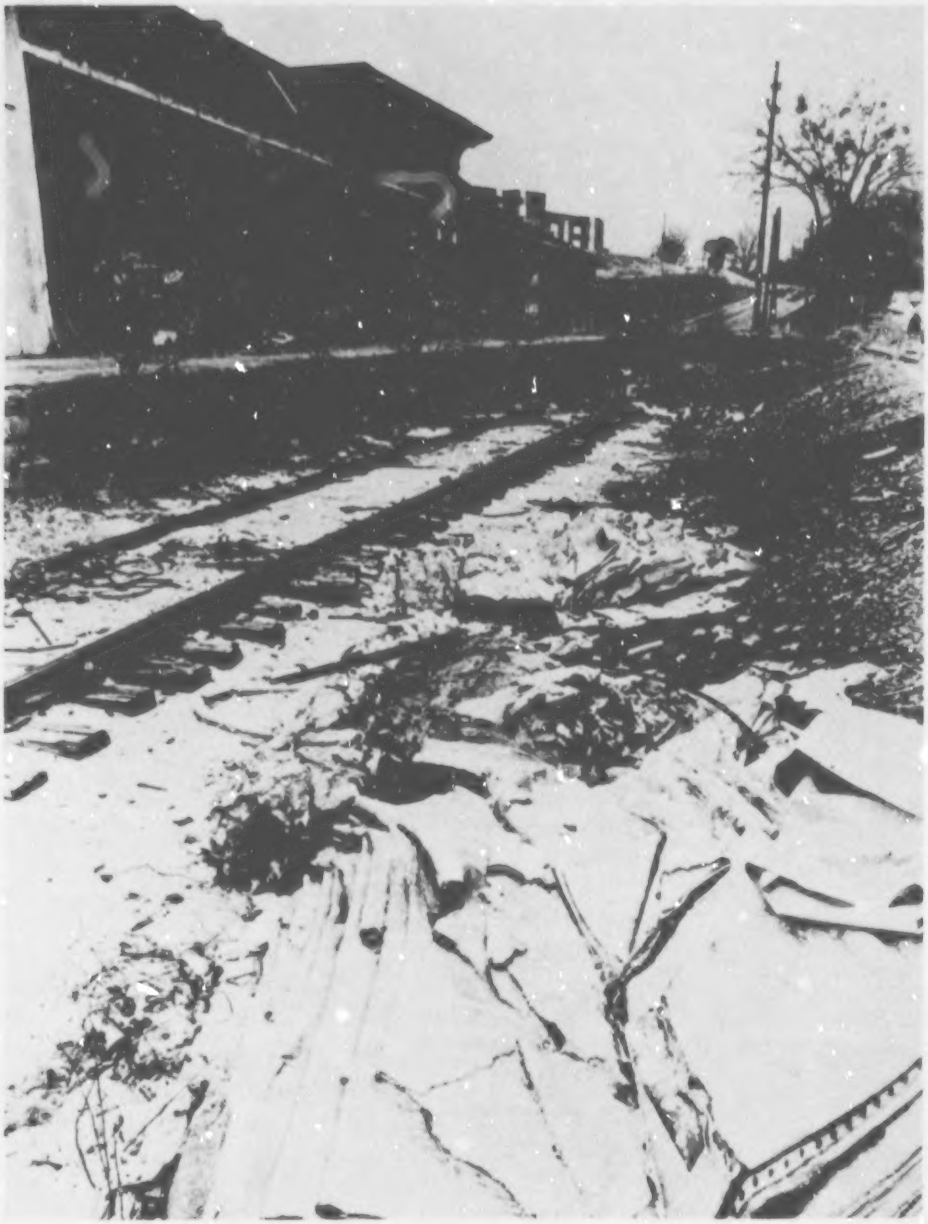


Figure 4.10. Photograph 3: Railroad station in disrepair.

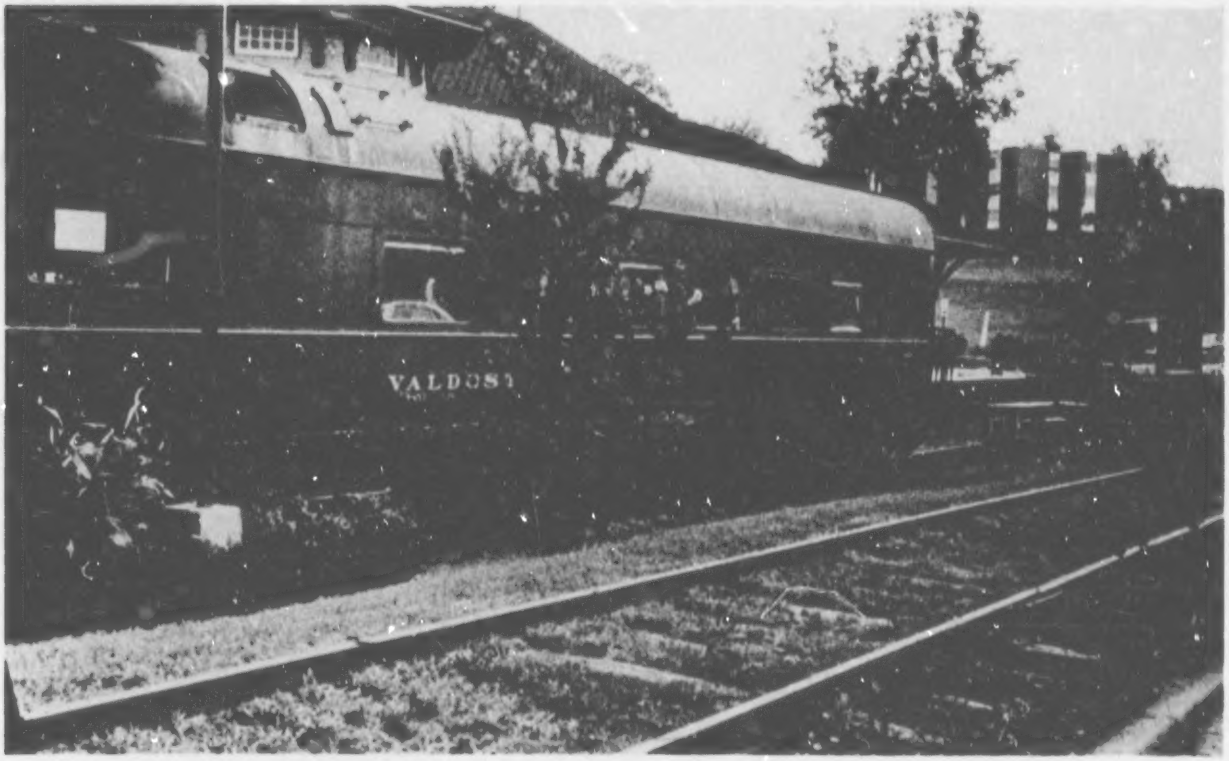


Figure 4.11. Photograph 4: Same station after restoration.

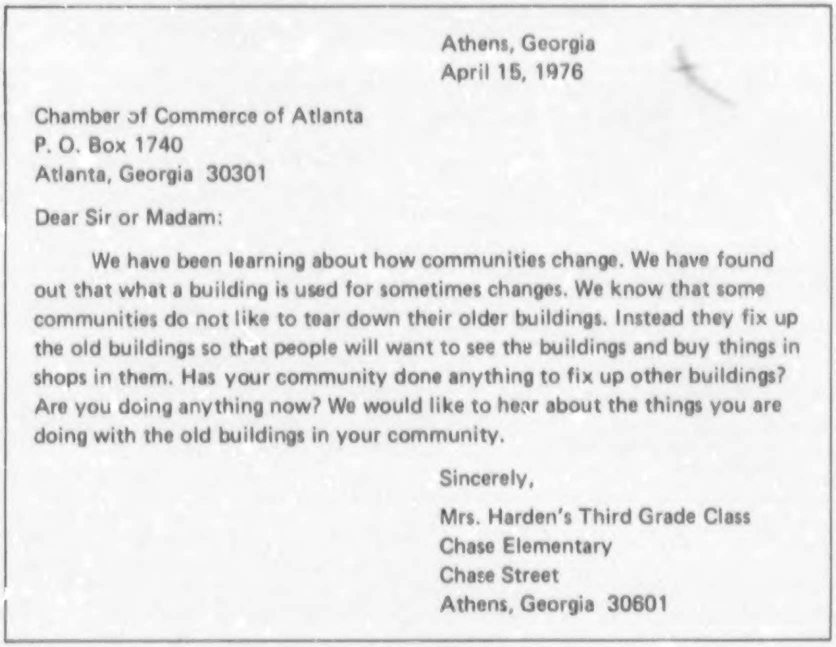
phasis is now directed to the use of the buildings and their general desirability from an aesthetic point of view. Students are asked,

"Which would you prefer to have in your community? Why?"

"Why do you suppose it was decided to keep and improve these older buildings rather than tearing them down and building new buildings?" (Bring out the aspect of sentiment, historical meaning, etc.)

Activity Five

The teacher presents the class with photographs of an older building in their community which is now vacant and rundown. Each child is asked to make up a plan for making the appearance of the building and the space around it more desirable and to identify appropriate uses for the building. To find out if other communities or cities have made efforts to remodel older buildings rather than tearing them down to make room for new structures, the children compose an experience chart letter which is transferred to a ditto sheet in order to send the same letter to several communities. (See Fig. 4.12, a sample letter.) As letters return, communities that have attempted to



Athens, Georgia
April 15, 1976

Chamber of Commerce of Atlanta
P. O. Box 1740
Atlanta, Georgia 30301

Dear Sir or Madam:

We have been learning about how communities change. We have found out that what a building is used for sometimes changes. We know that some communities do not like to tear down their older buildings. Instead they fix up the old buildings so that people will want to see the buildings and buy things in shops in them. Has your community done anything to fix up other buildings? Are you doing anything now? We would like to hear about the things you are doing with the old buildings in your community.

Sincerely,

Mrs. Harden's Third Grade Class
Chase Elementary
Chase Street
Athens, Georgia 30601

Figure 4.12. Sample letter of inquiry.

renovate older buildings are located and marked on a wall map. Finally, the teacher asks children to think of things they could do to improve the appearance of their school building and the area around it. As proposals are introduced, they are evaluated for feasibility and desirability, i.e., "Can it be done?" and "Should it be done?" If groups of students wish to carry out any proposals which are within their power and abilities, they are encouraged to do so.

A Closing Comment

The education community is always engaged in a search for alternative curriculum designs which will result in more and better pupil learning. In recent years this search has resulted in the acceptance of multidisciplinary and interdisciplinary approaches to social studies education as alternatives to the single discipline approach. Where are we headed next? No one can predict the future with much accuracy, but we contend that the years ahead will see extensive experimentation with transdisciplinary curriculum designs. By transdisciplinary design we mean attempts will be made to integrate *all* aspects of the school curriculum. Many traditional subject areas such as reading, language, social studies, mathematics, and music share certain objectives even though they also have unique contributions to make toward the preparation of an intelligent citizenry. In the near future it is likely that efforts will be made to integrate heretofore widely divergent school subject areas. Are geographers and geographic educators prepared to contribute? The growing recognition of the importance of "place and space" ensures that geography can, should, and will be an integral part of the curriculum of the future.

NOTES

1. Paul R. Hanna, Clyde F. Kohn, John R. Lee, and Clarence L. Ver Steeg, *Metropolitan Studies* (Glenview, Ill.: Scott, Foresman and Co., 1970).
2. W. Phillips Weaver, *People Use the Earth* (Morristown, N.J.: Silver-Burdett Co., 1972).
3. See Chapters 2 and 3 for for further discussions of geographic concepts.
4. William Gardner and Vincent Rogers, "Learning Principles," in *The Social Sciences and Geographic Education,* John M. Ball, John E. Steinbrink, and Joseph P. Stoltman, eds. (New York: John Wiley & Sons, 1971), pp. 54-63.
5. The term "civics" has now been largely abandoned and most high schools concerned with politics use a title such as American government.
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5

Geography and the Science Curriculum

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Physical geography—the geography of naturally occurring phenomena such as climate, landforms, and soils—is the "half" of geography that is usually neglected in today's kindergarten through twelfth grade geographic curriculum. Throughout these levels, unlike the college level, geography textbooks and curriculum largely neglect this important portion of the discipline. This neglect is serious and detrimental to providing a balanced liberal education for the students. Students may be exposed to some of the principles of physical geography through earth science programs, where such programs exist. However, even in those schools with good earth science programs, students are not taught the integrating concepts nor the basic principles of physical geography—principles which are essential to an understanding of the environment of mankind. A major thesis of this essay is that physical geography is not just a restatement of the various earth sciences. It is more and deserves a thorough representation in the schools.

There are at least two major reasons for the neglect of physical geography in the schools. First, physical geography has been erroneously perceived by many teachers as synonymous with earth science. From this premise one tends logically to ask, since educational resources and instructional time are limited, why allocate a portion of geography's small share to duplicate material covered in other classes? Second, geography is usually perceived by teachers as a social science. It is forgotten that geography as an academic discipline spans the gap which often separates the social and natural sciences, and welds them together. Solving geographical problems involves analysis of both human and natural-occurring phenomena, each with approximately equal importance. As a result, the attempt to solve many of the more important geographic problems without the discipline's physical component can only lead to unsatisfactory solutions.

This chapter explores some possibilities for bringing physical geography into today's geographic curriculum and examines its role in providing a more integrated liberal education. It will indicate the need to link the physical world with the human realm, thereby providing students with a better understanding of the total, interacting environment. In addition, possible strategies for integrating physical geography into the curriculum will be recommended. First, however, it is necessary to examine the nature of physical geography, determine its role within geography as a whole, and consider its relationship with the earth and other environmental sciences.

The Nature of Physical Geography

Defining the Field

Since it is well established in the colleges, we would probably be safe in turning to college textbooks to find an acceptable definition of physical geography. Physical geography is defined by Strahler, an eminent author of textbooks in physical geography, as "the study and *unification* of a number of earth sciences which give general insight into the nature of man's environment" (italics added). He adds that physical geography is "a body of *basic principles* of natural science selected with a view to including primarily the environmental influences that carry from place to place over the earth's surface" (italics added).[1] Muller et al. state that the primary concern of physical geography is with *man's environment at the surface of the earth* and with the *forces that shape that environment* . . . . Physical geography is also concerned with the *interactions between man and the earth.*'"[2]

From these definitions, as well as from numerous other definitions expressed in other texts,[3] several ideas about the nature of physical geography are evident. (1) Physical geography is closely related to the earth sciences since it investigates physical phenomena at the surface of the earth. Actually physical geography can best be conceived of as a natural science, dealing not only with physical phenomena of the earth sciences, but also with biological phenomena, and sun-earth and moon-earth relationships as well. (2) Physical geography is concerned with the *spatial distribution* of natural phenomena over the earth's surface. (3) Physical geography is concerned with the *causal relationships* between the distributions of two or more related phenomena, i.e., with process. The emphasis is on the way in which different components of nature function together through earth-surface space. (4) Physical geography is often concerned with the *interactions between man and his environment,* especially with the spatial aspects of those interactions. Man's use and modification of the earth is the focus of much inquiry.

In summary, physical geography is the science that studies *natural phenomena at the earth's surface* with respect to (a) their spatial distributions, (b) their spatial relationships, that is, the process between related phenomena, and (c) their spatial relationship with man, i.e., man-environment relations. By investigating these three central themes, students will gain a more complete understanding of the earth and man's place in nature.

Examining the Purpose of Physical Geography

In order to appreciate better how these themes are utilized in physical geography, it is useful to determine the practical functions (or roles) physical geography performs in reference to the discipline as a whole. Three general roles can be identified: (1) physical geography as the spatial science of natural phenomena, (2) physical geography as the handmaiden of human and regional geography, and (3) physical geography as an environmental science. In the first role the themes of spatial distribution and spatial relationships are emphasized to the exclusion of man-environment relations. Here we find physical geography without reference to humans. In the last two roles, the man-environment theme is very important, and what emerges is physical geography with man.

The first role, "physical geography as the spatial science of natural phenomena," does not deal directly with human affairs. For example, the geographic study of an area where people are not dominant in the landscape, such as Antarctica, can be approached without reference to human affairs. However, this type of analysis need not be limited to remote regions. Even in areas occupied and used by humans, the physical geography of the place can be examined without any reference to people. There may be some subsequent application to human needs—crops, housing, or resources—without humans being part or purpose of the study. For example, the physical geographer might study the processes and patterns of mountain-valley winds without any mention of human occupance. Studies within this category can be subdivided into those that emphasize spatial distributions and those that emphasize the spatial relationships between the distributions of related phenomena.

The geographical approach that examines the spatial patterns of individual phenomena in the environment gives a useful but simplistic perspective of nature. Students may be asked to examine, for example, a map of the distribution of precipitation across the United States, or the distribution of mountain ranges throughout the same area. Students might look for areas of unusually high and very low precipitation, they could locate major mountain ranges, such as the Sierra Nevadas, Cascades, Rockies, Ozarks, and Appalachians. These studies deal with basically static conditions. In advanced classes, single spatial distributions can be quantitatively analyzed, although such analysis would probably rarely occur in pre-college investigations. While the study of single distributions such as precipitation or terrain has merit, and may even be extended to the visual comparison of the two distributions, usually a study of the processes that produce distributions is more stimulating to both students and teacher.

This higher form of analysis is of spatial relationships. When we attempt to ascertain the reasons why a natural phenomenon, e.g., precipitation, has a given spatial pattern, we need to examine the distributions of related phenomena, e.g., terrain, and the processes that relate the two distributions. For example, if students are shown two maps of the same area, one of precipitation, the other of terrain, the similarity between the two distributions will be immediately apparent. They will almost surely begin to wonder whether one distribution has any causal influence on the other. Even a simple discussion of the processes involved in creating the distribution of precipitation should continue to stimulate interest in the students. Their understanding of the natural world will be enhanced as they learn that air, moving up a mountain slope, is cooled, thus losing its capacity to hold moisture, resulting in precipitation. If forced high enough, further cooling may result in snowfall. For more advanced students, a discussion of adiabatic processes, lapse rates, and rain shadows may be in order.

There is satisfaction and value in answering the question "why?"—why is there a similarity in the two map patterns? With this approach students learn not only about the co-varying patterns of precipitation and terrain, but they also learn about the *causal* or process relationship between the pattern of mountain ranges and the pattern of precipitation. Further, they may learn that because of the location of the Sierra Nevadas and the Cascades roughly parallel to the West Coast, and because of the dynamic distribution and flow from west to east of weather patterns across the continent, large amounts of rain and snow fall in the mountain ranges creating humid, alpine environments, while very low amounts of precipitation fall in the Great Basin to the east, creating a desert environment. With respect to physical geography as the spatial science of natural phenomena, it seems that investigating spatial relationships—studying both pattern and process—is more exciting than merely observing single distributions.

The second role of physical geography, that of serving as the handmaiden of human and regional geography, was important in the historical development of the discipline. From its beginning, a major purpose for the existence of physical geography in United States higher education was that of providing an understanding of the physical base or "stage" on which human activities occurred. Early in this century many geographers were seemingly obsessed with a desire to postulate possible affects of the physical environment on human behavior. At that time when some were trying to relate environmental factors as they change from place to place with human differences, the role of physical geography was easily recognized. At mid-century most geographers were more interested in regional studies than in any form of environmental determinism. But likewise in regional geography, the handmaiden role of physical geography is also evident. Generally the objective has been to describe the regional distributions of natural phenomena for the purpose of building a holistic view of an area. Typically teachers would have students investigate the distribution of landforms, soils, climates, and vegetation of the region under inquiry before they would investigate the distributions of peoples and their activities. The interrelationships of some of these factors were sometimes discussed, but probably not as often as would have been possible or desirable. With this approach, which is still relatively common in schools today, the study of the spatial relationships between distributions of related phenomena has been very limited.

Chorley recognized a dilemma that has emerged for physical geography in recent years.[4] When these earlier concerns dominated geography creating a major interest in man-environment relationships, the role of physical geography was clear. Today the emphasis in human geography has changed to the spatial activities of man, especially the socioeconomic activities. Much of the recent interest has been with man's activities as they are played out on a featureless plain. With such a change in emphasis, the relevancy of physical geography as the basis on which human and regional geography are built has been greatly undermined. It is believed that if these subdisciplines are reunited a richer geography will result. The emergence of this richer geography may be seen through the examination of physical geography as an environmental science.

The third role, that of physical geography as an environmental science, has been increasing in importance within geography at the college level. However, it is still relatively undeveloped in pre-college geography classes, probably because of the strong social science orientation. A turn toward a more environmental preparation and pedagogy will be very useful to teachers and will help provide students with a better grasp of man's place on earth. With increased interest in environmental quality, geographers have realized the importance of physical geography as an environmental science. The popular issues seem to deal with the deterioration of the physical environment by human exploitation. There is increasing interest in such topics as accelerated soil erosion, climatic modification, air and water pollution, environmental impacts of urbanization and modern agricultural technologies, man's impact on biotic communities, and the physical geography of cities.[5] Geography teachers whose training in natural sciences is weak would do well to upgrade their competence through reading and/or course work, and to introduce current and relevant man-environment issues and studies into their classrooms and field experiences.

With all three of the roles that physical geography performs within the discipline, the analyses of spatial distributions and/or the interaction of spatial relationships are at the core of each inquiry. In summary, spatial distributions can be studied in a basically static manner by learning the patterns and locations of particular phenomena. In order to understand the causal relationships behind a particular distribution, one needs to examine not only the distributions of related phenomena but also the processes by which they are related. These studies are more dynamic and are concerned with spatial relationships. If one of the distributions being studied is of people or a physical phenomena that has been modified by people, then the concern is with man-environment relationships.

Physical Geography and the Other Natural Sciences

In the preceding discussion, the question of how physical geography relates to the earth sciences and the life sciences has not been satisfactorily answered. Since this confusion seems to be one basis for the neglect of physical geography in school curricula, it needs to be explored in some depth.

Natural science is a broad group of distinct, but related sciences, each dealing with some aspect of the earth. The group consists of systematic earth sciences, biological sciences, and a geographical science. The systematic earth sciences attempt to answer questions about the nature of the inorganic features of the earth and the processes that occur within them, e.g., geology investigates the lithosphere; meteorology investigates the atmosphere. The systematic biological sciences deal with the biosphere, "life layer" surrounding the globe wherein life occurs, and answers questions about process and causal relations. The geographical natural science, which is physical geography, answers questions of a different nature, questions that deal with the spatial patterns and spatial processes according to the roles identified earlier.

The difference between physical geography and the systematic natural sciences arises out of differences in the types of questions asked. Physical geographers ask questions such as, "What are the patterns of naturally occurring phenomena and what processes have caused the natural features of an area to be of the particular type, shape, and location as we find them today?" They deal with questions of distribution, of integrated natural processes between the distribution of related phenomena, and of the impacts of human use and the potentials for human use of the natural environment. In order to find answers to these types of questions, physical geographers borrow selected concepts and principles from various earth and life sciences. This borrowed material is then reassembled and combined with original contributions concerning spatial organization to form a fresh, integrated science.

To gain an appreciation for the manner in which physical geography is able to utilize the systematic geosciences and still make significant contributions of its own, it will be helpful to examine briefly the sciences from which borrowing occurs and the types of concepts and principles that are borrowed. From *geodesy,* the science of the form of the earth, geography obtains principles that deal essentially with what has traditionally been a "starting point" in teaching physical geography, the basic shape and size of the earth.[4] These factors are relevant to the distribution of solar energy, the patterns of weather and climate, and the distribution of other important phenomena that affect man. It is helpful for students of the earth to have a feel for basic geodetic concepts and facts on which to build a geographic education.

The relationships of the sun and moon to the earth, a part of *astronomy,* have profound effects on the distributions of many of the most important phenomena over the surface of the earth. The sun, as it relates to the earth's shape and motions, provides certain patterns of life-giving energy to the earth. The spatial and seasonal variation of climate, vegetation, and water, and to a considerable extent human occupance and land use ultimately result from earth-sun relations. The moon is important to physical geography in the creation of tides, their patterns of distribution, and their relationships to man. Physical geography's contribution to school curricula is its strong emphasis on an integrated system that links certain astronomical patterns of motion, e.g., the earth's orbit around the sun, the earth's rotation, its inclination and parallelism, to certain spatial patterns on the earth.

These astronomical movements are expressed on the earth through temporal and spatial variations in the reception of solar radiation. The distribution of solar radiation over the earth's surface is extremely varied and plays a major role in the determination of weather and climatic patterns. Physical geography turns to the science of *meteorology* to obtain information about the processes that produce weather and climatic patterns. In physical geography we are interested in the integrated relations between solar energy, air temperature, winds, atmospheric pressure, storms, and precipitation; and we are interested in their dynamic patterns and distributions over the earth's surface. These patterns and processes are used to explain the distributions of climatic types and identify climatic regions. There results a science called *climatology,* which emerges at the interface between meterology and geography. At another interface, the one between physical and human geography, we examine the effects of climate on past, present, and potential human occupance. Again, we see that physical geography's contribution remains that of providing a spatial, holistic, and man-environment perspective.

Turning to the science of *geology*, physical geography utilizes material that strengthens this perspective. Some of the basic principles of geophysics, mineralogy, and structural geology are useful. It is surface form, i.e., terrain or landform, that is most geographical in nature. *Geomorphology* is the science that examines and interprets the earth's landform. This science has been traditionally researched by both geologists and geographers at the interface between the two disciplines, and it constitutes a major part of physical geography. The morphology and distribution of landforms are the result of the interaction of internal forces, i.e., tectonic forces which cause crustal deformation and the movement of molten rock, and external forces, i.e., gradational forces which cause a weathering of surface material, its erosion, and eventual deposition in a new location. The distribution of landforms and the related processes that have caused their evolution are very important in physical geography. These processes can best be investigated by relating geomorphic patterns to climatic, vegetative, and hydrologic patterns. Since the nature of landforms affects their use by humans, their distribution is important to human geography.

Acting as a veneer to the earth's surface, and providing an essential foundation for all life are the soils. *Pedology* is the science of soils, and physical geographers usually have a need to be familiar with the basics of this science. Especially important are soil types, their distributions, and their productive capabilities.

Hydrology, which studies the earth's surface and underground waters, is also a science that makes important contributions to physical geography. Fresh water is an essential element to man's survival; its distribution over the earth's surface is greatly varied, altering the patterns of human use over the land surface. In a related manner oceanography contributes. The oceans cover over two-thirds of the earth, at the same time providing both transportation barriers and highways and providing great potentials as a resource base.

Life sciences are fundamental to geographic understanding. Physical geographers helped formulate and now participate with biologists in an interfacing science called *biogeography*. Biogeography is the study of the distributions and migrations of plants and animals. It is often separated into two subsciences: plant geography and zoogeography. It is the structure and distribution of natural vegetation and animals, and not domesticated vegetation and animals generally, that is of interest to biogeographers. Actually, plant geography has come to be much more fundamental physical geography than has animal geography, although there is considerable room for development of the latter also.

Each of the above systematic sciences is concerned about a particular natural system or phenomenon—its nature and behavior, and the processes that shape it. For example, a geologist or hydrologist might be interested in the processes of stream erosion but probably has little concern about the place where it occurs, except perhaps indirectly. For geographers, place and distribution—local, regional, and global—are fundamental. To a geographer, processes between interacting phenomena are important as a means to understanding the spatial patterns, similarities, and differences from place to place, and the relationship of natural distributions to human activity. For example, how do stream patterns relate to vegetation patterns?

In summary, physical geography is not a mere aggregation of the systematic earth and biological sciences. It is a separate and distinct science that asks questions of a different nature. In order to answer adequately these questions, the science needs a holistic approach, an approach that encourages physical geography to interrelate freely with cognate sciences whenever the need arises. Probably more important to teachers is the problem that the other earth and biological sciences are not generally asking questions about distribution, spatial interaction, or man-environment relations. Students who never study physical geography, are missing an important part of their liberal education—the spatial perspective of how natural environments differ from one place to another, how they are changing, and why. Moreover, after several decades of intense specialization among the sciences, there is a special concern today about generalizing and relating components of the environment and integrating it with human activity. Physical geography is in an ideal position to deal with this integration at the earth's surface. Geography by its very nature promotes the synthesis of related materials from various sciences, and helps provide students with a "big picture" of the earth.

Providing a More Balanced School Curriculum

If physical geography is not included in the liberal education of students, three gaps tend to emerge. (1) A gap emerges within the learning of geography itself. When the physical and environmental elements are left out, we are unable to examine the environmental half of man-environment relations, or to engage adequately in regional studies. (2) A gap emerges in the natural sciences. When spatial distribution and interaction and man-land relationships are not emphasized, students are not likely to obtain a holistic picture of how natural systems in various places on earth work together and how people fit into the system. (3) A gap emerges between the social and natural sciences. On the one hand, we have studies that deal almost completely with human life, and on the other, studies that deal with the nonhuman world. Geography with its physical component can bridge that gap.

In recent decades the emphasis in geographic education in schools has shifted away from an integration of human and natural phenomena to an examination of socioeconomic phenomena. Increasingly geography is being perceived as one of the social studies. The physical "half" of the field tends to be overlooked in textbooks and curriculum which almost completely exclude any analytical treatment of physical geography. The image of geography as a social science tends to be solidified by many administrators who think of geography and history as being essentially the same. "A person trained as a history teacher can obviously handle geography." This kind of thinking is prevalent not only among many administrators, but also among many history teachers.

In order to provide students with a well-rounded education, teachers, teacher-trainers, and administrators will need to restore some balance to geography in the precollege curriculum. Perhaps a 50-50 balance between human and physical geography would not be possible or even desirable, but an improvement is needed. The type of physical geography that does appear in texts is usually routine and superficially descriptive, rather than conveying any analytical understanding of principles operating in the student's natural environment.

What the Geography Teacher Can Do

Ideally the quality of earth science education in the school will be a concern of the geography teacher. In those schools that have a strong earth science program the task of implementing sound physical geography instruction into the combined earth science and geography curricula may be quite effective. It requires a high degree of cooperation between the geography teacher and the earth science teacher to be certain the spatial and man-land aspects are being covered. In this regard the geography teacher can function as a resource person for the earth science teacher by furnishing maps, charts, and ideas. Field trips can be joint ventures, helping students to locate features from the natural as well as the man-made environment and helping them to discover the ways in which the two are related. The geography teacher may need to teach some of the basic ideas of physical geography if they are not covered in the earth science program, i.e., spatial distribution and interaction, and man-environment dimensions. Students should especially be exposed to the problems of environmental quality, not only in terms of processes, but in terms of place to place variations.

In those schools with a weak earth science program, the task becomes more difficult. The majority, if not all, of the teaching of physical geography will need to be done in the geography class. With social, economic, and regional material to teach, the time left for physical geography will be limited. The geography teacher will need to select carefully those materials and activities that provide the most fundamental basis for understanding the natural environment, its spatial and interacting systems. In order to achieve the most satisfactory integration, it will probably be best to emphasize the man-environment aspects of physical geography, always relating the environmental base back to man.

Learning Activities

The learning activities suggested below were developed primarily for students at the secondary level. With simplifying modifications, many of these activities can be used with elementary students. Even if an elementary teacher finds it too difficult to make these modifications, a reading of the references will aid in the creation of more applicable approaches. The outline is not comprehensive, but is given only as a sampling of possible strategies. The description of each activity is very brief. Each activity is relatively easy requiring only moderate preparation by the teacher. The references included with each activity will provide adequate information.

Two principal sources of these activities were developed as national curricular programs funded by the National Science Foundation. The first is the Earth Science Curriculum Project (ESCP),[7] the second is High School Geography Project (HSGP).[8] The first edition of the ESCP program has more physical geography included in its activities than the revised edition. (Each edition is referenced separately.) The ESCP and

HSGP programs were selected because of their relatively wide distribution in the schools and the fact that a well-developed teacher's guide accompanies each program. Other sources include two college textbooks in physical geography, one by Strahler[9] and the other by Muller et al.[10] Although they are college textbooks, they were selected because of their relatively simple, yet complete coverage of topics in physical geography and because they are widely available. Many other college textbooks in physical geography could serve equally well as background references. The activities below are grouped according to major divisions in physical geography.

Selected Learning Activities

A. The earth: size and grid

1. Size

Activity: Students measure the circumference of the earth by using Eratosthenes' basic method.

Activity references: "Measuring the Earth," ESCP (1967), section 3-5; and ESCP (1973), section 1-2.

Background reference: Strahler, pp. 6-7.

2. Grid

Activity: Students develop a reference system on a sphere, compare results with the latitude and longitude system on the earth. They determine their own latitude by observing the altitude of Polaris above the northern horizon and identify their latitude and longitude from maps.

Activity reference: "Investigating Positions on a Sphere," ESCP (1967), section 3-2.

Background reference: Strahler, pp. 5, 12-14; or almost any physical geography textbook.

B. Geography of weather and climate

1. Earth-sun relations

Activity: Arrange four small globes in a circle on a table in such a way that they represent the equinoxes and solstices. Using chalk, draw on the table top the earth's orbit, and write the name and date of the equinox or solstice beside each globe.

Activity reference: Strahler, p. 74.

Background references: Muller et al., pp. 48-53; Strahler, pp. 59-73.

2. Radiation and latitude

Activity: Teacher demonstrates by moving a globe around a light the angles at which the sun's rays strike the earth at different latitudes as the earth rotates and revolves around the sun.

Activity reference: ESCP (1967), section 4-5.

Background references: Muller et al., pp. 48-55; Strahler, pp. 59-73.

3. Temperature field

Activity: Students measure classroom temperatures at floor level, desk-top level, and two or three meters above the floor. They draw a map for each level by connecting with lines points of equal temperature. They relate their maps of their classroom temperature field with regional maps of temperature and pressure fields.

Activity reference: "Investigating a temperature field," ESCP (1967), section 5-1.

Background references: Muller et al., pp. 67-73; Strahler, pp. 131-35.

4. Weather maps and patterns

a. Learning to use weather maps

Activity: Students use daily weather maps of the United States and identify highs, lows, air masses, and fronts. They compare the shapes of cyclones with the cloud and precipitation patterns around them and ascertain general patterns of structure and movement.

Activity reference: "Investigating Weather Maps," ESCP (1967), section 8-13.

Background references: Strahler, pp. 188-94; Muller et al., pp. 115-21.

b. Local and national weather patterns

Activity: Students use their own daily weather observations and the daily weather maps of the United States to see how their local weather conditions fit into a broad, moving pattern of weather conditions across the continent.

Activity references: "Weather Watch," ESCP (1967), sections 1-8 and 8-9; ESCP (1973), sections 3-2 and 7-1.

Background reference: Strahler, pp. 188-94; or almost any physical geography textbook.

5. Climate

a. Climatic charts (i.e., climographs)

Activity: Students complete a climatic chart for their local area with data supplied by teacher.

Activity reference: Data: Potential evapotranspiration and precipitation data from ESCP (1967) Teacher's Guide, pp. 392-97; temperature data from local weather station.

Background reference: Strahler, pp. 251-90.

b. Climatic regions

Activity: Students identify major latitudinal zones of converging and diverging air masses and indicate wet and dry zones on an imaginary continent. Then they match a group of climatic graphs and photographs with the zones. World climatic zones are studied in a similar manner.

Activity references: "The Climates of an Imaginary Continent," ESCP (1967), section 11-1, 11-7, 11-8; ESCP (1973), section 7-10.

Background references: Muller et al., pp. 160-79; Strahler, pp. 239-92.

c. Climate and land use

Activity: Students are shown a selection of photographs of natural and seminatural landscapes from various climatic regions. For each photograph, they identify the major climatic region represented, the nature of the climate, and the potentials and limitations to the human use of the land.

Activity references: Photography: Muller et al., pp. 230-51; Strahler, pp. 253, 347-60; *National Geographic* and other popular magazines.

Background references: Muller et al., pp. 230-57; Strahler, pp. 239-92.

C. Geography of landforms

1. Maps and aerial photography as tools in studying landforms

   Activity: Students use photography and topographic map to discover how maps can function as models of the earth.

   Activity references: "Maps as Models," ESCP (1967), section 3-9; ESCP (1973), section 9-7.

   Background reference: Background material for all of the activities in the landform section can be found in almost any physical geography textbook.

2. Stream action and leveling the land

   Activity: Students use a stream table with running water to observe the changes that take place when a stream of water flows over the land surface.

   Activity reference: "Investigating Stream Erosion," ESCP (1967), section 12-6 and 12-7.

   Background references: Muller et al., pp. 295-307; Strahler, pp. 413-53.

3. Regional landforms

   Activity: Students use maps and aerial photographs to study landforms. They "delineate various geographic regions of the United States," and they examine the interrelationships between internal (mountain building) and external (erosional) processes as reflected in the landscape.

   Activity references: "Regional Landscapes," ESCP (1967), section 21-7; ESCP (1973), section 14-10.

   Background references: Muller et al., pp. 347-73, 422-43; Strahler, pp. 515-20.

4. The Ice Age

   Activity: Students use a map of a glaciated region along with other data which shows "the evidence left by glaciers to reconstruct the events that shaped the landscape."

   Activity references: "The Ice Age Puzzle," ESCP (1967), section 20-10; ESCP (1973), section 18-8.

   Background references: Muller et al., pp. 376-93; Strahler, pp. 531-39.

5. Pattern of earthquakes

   Activity: From recorded material, students plot epicenters of earthquakes on a world map by latitude and longitude coordinates and relate patterns to crustal movement.

   Activity references: "Earthquake Watch," ESCP (1967), section 1-7 and 14-5; ESCP (1973), section 3-3 and Appendix D.

6. Relation of earthquakes to man

   Activity: After viewing pictures of the destructive nature of earthquakes, students compare the pattern of epicenters with the world distribution of population and then discuss the problems of earthquake hazards to man's activities.

Activity references: Pictures, Strahler, pp. 500-501; ESCP (1967), section 25-26; 318, 319.

7. Landform-land use patterns

   Activity: Students use topographic maps and aerial photographs to help explain how man uses an area based on local terrain. They may also use this information to help them predict future land use.

   Activity reference: "Watchung," HSGP, Unit 5, Activity 3.

D. Geography of water

1. Distribution of water and land

   Activity: With the use of maps, students can discover the distribution of oceans, seas, major lakes, and major rivers on a global, regional, and local scale.

   Background reference: Various maps and atlases.

2. Water balance and man

   Activity: Students work with water balance graphs and discuss implications to man of water balance and seasonal variation.

   Activity references: "Water Balance," HSGP (1970), Unit 5, Activity 6; ESCP (1967), section 9-9.

   Background reference: Muller et al., pp. 150-56.

3. Flood prediction

   Activity: Using rainfall and stream flow data, students will predict floods.

   Activity reference: "Investigating a Flood," ESCP (1973), section 8-9.

   Background reference: Strahler, pp. 224-29.

4. Flood hazard

   Activity: Students identify why floodplains are persistently used by man, and with the use of cost-benefit ratios, they discuss various adjustments that are open to occupants in flood-prone areas.

   Activity reference: "Flood Hazards," HSGP, Unit 5, Activity 5.

5. River environments and man

   Activity: With the use of data charts on precipitation, temperature, and soil conditions, students describe environmental features that exist along two rivers and identify some of the reasons similar environments are used differently.

   Activity reference: "Two Rivers," HSGP, Unit 5, Activity 2.

E. Man modifies the earth

   Activity: With the use of still photographs of various landscapes throughout the world, students identify how man has adjusted to the environment and how he has changed it.

   Activity reference: "Habitat and Man," HSGP, Unit 5, Activity 1.

Summary and Conclusions

Physical geography has been largely neglected in the elementary and secondary schools. This is largely due to the perceptions that geography is part of social studies and that geography is a duplication of the systematic earth sciences. Neither of these conditions reflect the position of geography among the sciences or the nature of physical geography as taught in colleges. Geography is a science which spans the social and physical sciences. Geography has near-equal ties to both the human and the nonhuman world. Geography, without physical geography being well represented, is incomplete since the important environmental base is missing.

Physical geography deals with questions that the systematic earth sciences and life sciences largely neglect. The central themes of physical geography, i.e., spatial distribution, spatial interaction, and man-environment relationships, are different in emphasis from those of its cognate sciences. An earth science class without physical geography is incomplete since spatial and man-environment questions would tend to be neglected. Students who are not taught physical geography experience major gaps in their liberal education. Geography teachers will probably want to refresh their knowledge of physical geography so they can use skill and creativity in helping students appreciate the balance that exists between nature and man in geography today.

NOTES

1. Arthur N. Strahler, *Physical Geography*, 3rd ed. (New York: John Wiley & Sons, 1969), pp. 1-2.
2. Robert A. Muller et al., *Physical Geography Today* (Del Mar, Calif.: CRM Books, 1974), p. v.
3. See for example: Glenn L. Trewartha et al., *Physical Elements of Geography*, 5th ed. (New York: McGraw-Hill Book Co., 1967), p. v.; Henry M. Kendall et al., *Introduction to Physical Geography*, 2nd ed. (New York: Harcourt Brace Jovanovich, 1974), pp. 3-5; and Richard J. Chorley and Barbara A. Kennedy, *Physical Geography: A Systems Approach* (London: Prentice-Hall International, 1971), pp. vi-ix.
4. Richard J. Chorley, "The Role and Relations of Physical Geography," *Progress in Geography*, vol. 3 (London: Edward Arnold, 1971).
5. Ian R. Manners and Marvin Mikesell, eds., *Perspectives on Environment* (Washington, D.C.: Association of American Geographers, Commission on College Geography, 1974).
6. It should be noted that a starting point for the teaching of physical geography can just as logically begin with the local environment. In fact, given today's popular concerns, the local environment may be the best place to begin to focus attention and establish environmental relationships.
7. American Geological Institute, Earth Science Curriculum Project, *Investigating the Earth*, text and teacher's guide (Boston: Houghton Mifflin Co., 1967; rev. ed., 1973).
8. Association of American Geographers, High School Geography Project, *Geography in an Urban Age* (Toronto: Collier-Macmillan, 1970).
9. Arthur N. Strahler, *Physical Geography*, 4th ed. (New York: John Wiley & Sons, 1975).
10. Robert A. Muller et al., *Physical Geography Today* (Del Mar, Calif.: CRM Books, 1974).

6

Teaching Geography Through Inquiry

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Inquiry has become one of the most significant teaching strategies in education today. Its rediscovery by prominent educators during the past decade has led to a renaissance of instructional patterns. Many teachers wish to implement this technique in their geography and social studies classes. This chapter presents an inquiry model that is a viable and adaptive structure for shaping instruction sequences in the elementary or secondary school.

Inquiry is especially involving and motivating for students, but its greatest benefit is the development of an investigation-oriented or process approach to learning geography. Through inquiry experiences students can become more adept in their ability to discover and use significant geographic ideas while simultaneously acquiring knowledge consonant with the geographer's view of the world. The more skillful students become in using inquiry, the better they will understand important geographic concepts and principles. Through the inquiry process the knowledge and skills of the geographer can be integrated with the classroom role and responsibilities of the classroom teacher to meet the needs and interests of the students as they interact with their environment.

The Nature of Inquiry

One of the more fascinating aspects of the inquiry strategy is the diversity of practices that it has spawned. One approach to inquiry teaching is offered by Beyer who presents a five-step model for structuring learning experiences to involve the students in the inquiry process.[1] First, a purpose or reason for learning is identified, either by the teacher or the learner. Second, alternative solutions or suggested answers are hypothesized; usually, this is done by the students with little teacher guidance except for appropriate questions. Third, the hypotheses suggested are tested through the

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assembling, arranging, and analyzing of evidence. Fourth, the hypotheses are accepted or rejected, and conclusions are developed. Fifth, the conclusions are applied to new data and generalizing occurs.

Suchman views the process of inquiry as learner-controlled and directed.[2] He also sees it as primarily an individual or small-group activity. The teacher facilitates the process by creating a climate that promotes exploration and curiosity. Three conditions are required: a discrepant event that leads to questioning, a classroom climate that allows the student to gather data and to test his theories as he chooses, and an environment that will yield the needed data. The teacher offers the event without comment, allows the students to speculate without reward or punishment, provides opportunities for exploration of the event under varying conditions, and encourages the students to draw their own conclusions from their own investigations.

Taba et al. provide a rather elaborate three-phase model that can be used to teach ideas through inquiry.[3] The first phase requires students to form concepts through listing, grouping, and labeling items. The second phase requires data interpretation through generalizing, inferring, and explaining observed relationships. The third stage permits application of principles through predicting consequences and hypothesizing, through supporting these predictions and hypotheses with evidence, and eventually through the verification or rejection of the principles.

A Model for Inquiry

We have chosen to promulgate a version of inquiry that seems especially practical and appropriate for use with children of elementary school as well as secondary school students. The model is based on certain assumptions about the constraining realities of teaching in the elementary school. The same assumptions apply to secondary school, although regarding the first item, teachers are generally better prepared in their geographic knowledge, if not their conceptual and methodological understanding of geography. These assumptions are:

1. The teacher often has limited geographic expertise.
2. The teacher has limited access to geographic scholars to assist in curriculum development.
3. The teacher often has been assigned to a specific curriculum to cover each year.
4. The teacher has limited time and resources available.
5. The structure of the school places certain limits on the student's freedom of choice.

Even with these constraints, however, the inquiry teaching strategy is an extremely useful tool for the classroom teacher. Diligent application of the model in Figure 6.1 can bring effective inquiry into the classroom. The model consists of assigning complementary roles and responsibilities to the geographer, the teacher, and the student.

The Role of the Geographer

If geography is to be meaningful and realistic in the classroom, then the ideas on which the curriculum is based must be defined by the geographer. To eliminate

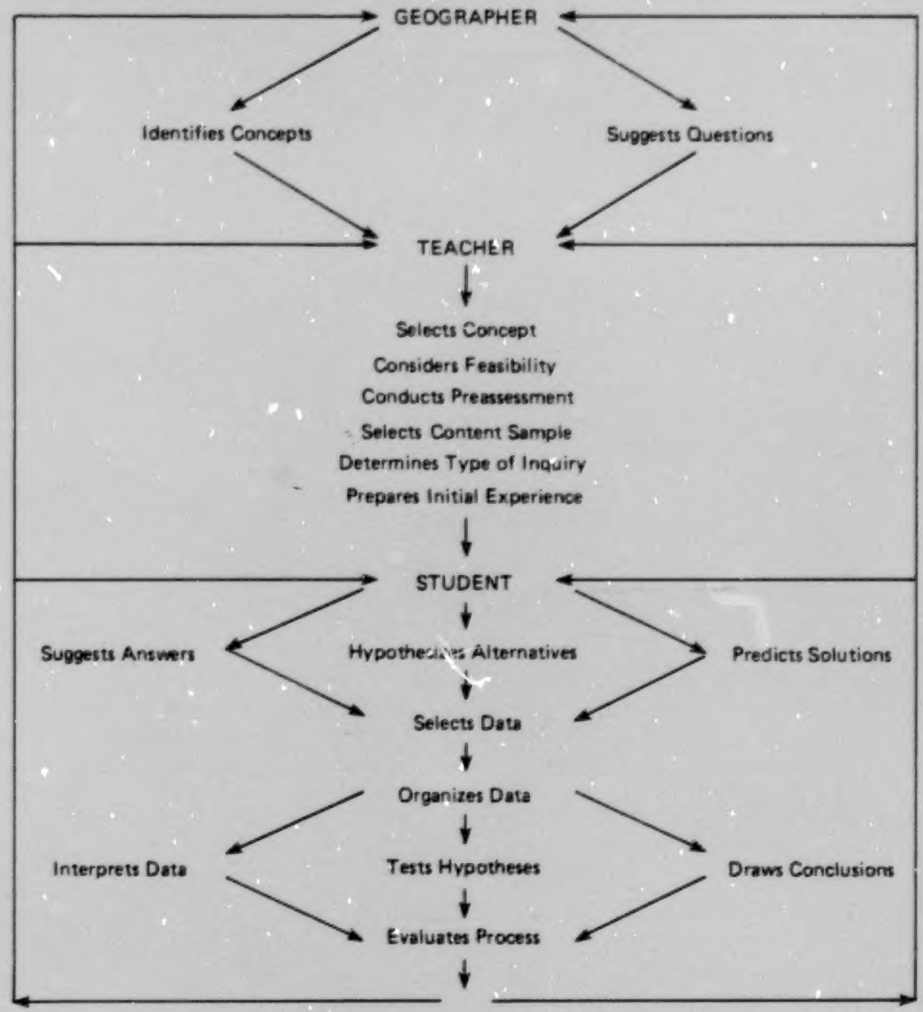
GEOGRAPHER
Identifies Concepts
Suggests Questions
TEACHER
Selects Concept
Considers Feasibility
Conducts Preassessment
Selects Content Sample
Determines Type of Inquiry
Prepares Initial Experience
STUDENT
Suggests Answers
Hypothesizes Alternatives
Predicts Solutions
Selects Data
Organizes Data
Interprets Data
Tests Hypotheses
Draws Conclusions
Evaluates Process

Figure 6.1. An inquiry model.

elements such as trivial topics, environmental determinism, and "strange lands and funny peoples" from the curriculum, it is essential that the geographer designate those concepts most useful for an understanding of geography and that the teacher rely on the geographer to define those concepts that can be studied most profitably. We believe a geography curriculum structured around concepts identified by the scholar is not an unreasonable constraint on teachers or learners. Instead, such a curriculum increases the likelihood of relevant, purposeful, and productive geographic inquiry.

Beyond the present volume there are a number of other sources in which geographers have defined significant concepts; only three are mentioned here. *Geography: Its Scope and Spirit* provides the classroom teacher with basic concepts in geography and suggests some instructional sequences.[4] *The Social Sciences and Geographic Education* is a very useful collection of essays presenting a variety of viewpoints on the most important ideas to be taught in geography.[5] *Focus on Geography: Key Concepts and Teaching Strategies* provides an excellent introduction to modern geographic thinking and ways to implement it in the classroom.[6] Any one of these volumes would assist the teacher in exploring the nature of selected geographic concepts suitable for the elementary or secondary school. The geographer also is important in determining the questions that might be asked in order to explore geographic ideas and in providing a body of information related to the concept from which the teacher can draw his content. The geographer points out the vastness of the geographic discipline and shows how it can be organized in meaningful ways; the teacher chooses and adapts those ideas most relevant for the learners.

The Role of the Teacher

The first responsibility of teachers in preparing to use the inquiry strategy is to consider its feasibility for the objectives and topics under consideration. They must decide if inquiry rather than exposition, valuing, or some other strategy is most appropriate. They must be certain that sufficient time is available, for inquiry tends to be a rather lengthy process. They must evaluate the available resources, such as printed and nonprinted materials, resource people, and space. Teachers also have a responsibility to determine the readiness of their students to participate in the process. Through the use of a simple checklist or other device, teachers can determine if the students have acquired the necessary prerequisites for inquiring. Can the students ask questions for themselves? Have they had experiences in examining data and making observations? Do they know how to classify and organize their material? Have they had some experience in drawing conclusions? What stages of the inquiry process are they able to do best? Which are most difficult? Have the students some prior knowledge and experiences with the concept? Are there some aspects of it that they know and others which are totally new? Which attributes of the concept can be learned through the inquiry strategy at this time? Such preassessment is essential in preparing for successful inquiry experiences.

After determining the feasibility of inquiry for teaching the concept and assessing pupils' present understanding, the teacher organizes the instructional sequence. First, they examine the content and topics to be covered in their grade level and decide which are especially appropriate for learning the identified concept. Next, they locate specific phenomena, examples, instances, or data useful in developing the concept. Third, they select from among the possible ways in which inquiry could be conducted, e.g., Suchman's discrepant event, Taba's listing, grouping, and labeling; the strategy that seems most appropriate for their students as well as for the learning objectives. In some instances, depending on the students' maturity, teachers may perform an additional step by not only providing the initial generative experience for the students but also determining how the students will proceed in their inquiry. In other cases, however, they may provide only the initial experience which identifies a purpose or a problem for inquiry but does not specify how the students are to proceed. Once teachers have considered the feasibility of inquiry, identified the concept, selected the content to be used for illustration, constructed the inquiry sequence and determined the assignment of tasks to the students or decided to allocate this responsibility to their students, then the roles change. Teachers become facilitators of the inquiry process as well as fellow inquirers.

The Role of the Student

Typically, students conduct the inquiry. Their first responsibility is to generate probable answers to the questions, to hypothesize about results or theories, or to predict what might happen in varied situations. They then collect, from varied sources, data that might be useful in examining the suggested answers, hypotheses, or predictions. Data can be collected by the whole class, by small groups seeking information to support different possibilities about the same problem, or by individuals on various aspects of the hypotheses, solutions, or predictions.

Students also can be encouraged to inquire into problems which they themselves generate. This is particularly effective with individual students who have developed excellent inquiry skills and are able to delve deeply into problems, seeking their own resources and posing their own limits. As schools attempt to personalize instruction, this form of inquiry becomes increasingly important. All children should have some experiences of this kind, although circumstances will probably not permit them to learn this way exclusively.

After gathering their data, students attempt to organize them in a meaningful way. This might take the form of a chart that categorizes the information; it might be a set of notes keyed to various aspects of the hypothesis; it might be a visual presentation using pictures and commentary; or it might be an oral tape describing the observed data. The method of organization is less important than the purposes for which the data have been organized and the ways in which the data will be used. This may seem to be beyond the reach of elementary school children. The words may sound awesome, but the ideas are simple. It's the same procedure the students will follow if left on their own. The purpose here is to formalize the procedure to discipline the student toward more efficient learning. The process is the same for the elementary school student as for the secondary student, although the degree of sophistication will be simplified.

With the data in some definable format, the student interprets them and offers possible solutions to the problem or plausible answers to the questions. This stage of prediction and interpretation is part of the attempt to verify or reject the hypotheses first generated; in some cases this involves drawing conclusions as well. These interpretations, predictions, and conclusions could be reported in any of several ways—for example, oral reports, visual presentations, or written evaluations. In most instances, the inquiry strategy will have produced diverse conclusions that can be discussed and compared by members of the class.

The last step is the evaluation of the inquiry process itself. If students are to become process-oriented and skilled in inquiry, then this step is crucial. It allows them to examine the stages of inquiry and how each advances learning. This can be done through a debriefing session which assesses the ways in which each student participated, the availability of appropriate data, the kinds of data used, the different ways in which data were organized, and the types and quality of conclusions. Students can consider the ways in which they work most efficiently in data collection, the kinds of problems that lead to the most interesting inquiry, and the manner in which they changed as they worked through the process. Students could be asked to submit written evaluations of how well the class was able to perform its required tasks. As they work through the process repeatedly, they will discover which methods are most effective for data collection. They also will determine the effectiveness of various methods of data organization and interpretation and the suitability of each for different kinds of topics. The teacher and the students, as well as the geographer if at all possible, should work together in the evaluation, but the learners must be primarily responsible for determining its effectiveness.

The next portion of this chapter examines selected geographic concepts. Subsequently, examples of how these concepts might be taught through inquiry experiences will be presented.

Selected Geographic Concepts

From the many concepts used by geographers, four have been selected for close examination: sequent occupance, gradient, personal space, and time-space convergence. The meaning of each concept will be discussed and then some instructional modules aimed at helping students inquire into the meaning of the concepts will be presented.

Sequent Occupance

Some of the more persuasive evidence for the proposition that the environment does *not* dictate people's lifestyles comes from studies of the succession of different cultures which have inhabited a particular landscape. Geographers long have been interested in sequence of occupance and regard it as a major conceptual framework for the field. Sequent occupance demonstrates that the infinitely varied cultural adaptations of people to environment through the use of tools, techniques, and social organizations should be studied as well as the environment itself. In a sense, the environment is nothing more (but, of course, it is likewise nothing less) than a set of opportunities and a series of constraints for human culture.

Why have geographers devoted time and resources to studying sequent occupance? There are several reasons. It serves as a framework which can be used to explicate and document the impact of man on the landscape. The sequent occupance framework assists scholars in the development of a catalog of types of man-land relationships, a taxonomy of global human adaptions to varying environments. Finally, it is the key research tool for the subfield of historical geography which focuses on geographic relationships within segments of time.

The area bordering the Great Lakes provides an interesting case of sequent occupance. Beginning with aboriginal inhabitants, the landscape was subsequently transformed by fur traders, merchants, lumbermen, agriculturalists, and finally urban-industrialists. From the point of view of landscape impact, aboriginal occupance had relatively little effect. Except for the possible use of fire to drive big game in cooperative hunting enterprises, the North American aborigine's environmental influence was probably restricted to inadvertent but minor modification of vegetation, such as ringing trees for bark or picking and scattering various berries and herbs in food-gathering. Since they were not settled agriculturalists, little impact on soil or micro-climate is recorded; streams, rivers, and topography remained intact and ecologically healthy. Only edible fauna were significantly affected, and this was limited to a few species such as buffalo.

The merchants and traders who came to the Great Lakes region at the end of the seventeenth century also left little obvious environmental evidence of their occupance, although they remained for almost two hundred years. This resulted from their limited technology as well as their exclusive purpose of collecting furs and forest products for international markets. Their impact was confined to the depletion of a few fur species, the erection of forts and trading sites, and the establishment of routes to and from resource supply areas.

Lumbermen were the first group to seriously alter the landscape of this region. The initial demand stemmed from the need of the British merchant fleet for ships, spars, and masts and was followed by the need for lumber and wood products required by a growing population. The cutting of millions of acres of prime virgin timber proceeded from the East Coast of the United States during the late eighteenth century across the continent, devastating forests in Michigan (1820-1849), Wisconsin (1850-1859), Minnesota (1880-1889), and onward to the western states of Washington and Oregon (1920 to the present). Presently, of course, the occupation of much of this area by an urban-industrial culture is producing massive changes in the environment in relationship to the atmosphere, soils, water, vegetation, and rock complexes. In general, the Great Lakes region has witnessed a succession of occupations that have generated change in the direction of decreasing environmental health through the loss of indigenous vegetation, modification of soils and micro-climate, and increasing population pressures on the environment.

Gradient

Urban geographers have noted that population density is not the same for all places in an urban area. Typically, residential population is most dense near the city center and with lesser densities occurring away from it. The concept of decreasing residential density from the center of the city to the periphery is called the population density gradient. Many factors explain why this gradient occurs but the major factor consists of "trade-offs" between accessibility to employment, entertainment, schools, and shops on one hand, and lower land costs and access to open space, on the other. The family living near the city center foregoes such things as spaciousness and lower per unit cost of land, whereas the suburban or exurban family foregoes the somewhat easier and less costly access to jobs, specialty shopping and services, as well as the social and cultural amenities enjoyed by the city or inner-city family.

The tendency for the spatial distribution of any phenomenon to exhibit a concentration near the center of the distribution with decreasing density toward the periphery is not restricted to urban populations. It can be seen in numerous other distributions such as the way in which people distribute themselves in a wilderness recreation area. Lucas discovered, for instance, that the farther one traveled by canoe away from entrance points in Minnesota's Boundary Waters Canoe Area, the fewer people one encountered.[7] In other words, the density of recreation area users is graded from the highest concentration near park headquarters to the lowest in the remote areas, a phenomenon probably attributable to the advantages of being accessible to park services and the uneasiness of most individuals in real wilderness.

The unifying reason for the occurrence of gradients in distributions of residences in cities, crops in an agricultural region, vegetation and animals in their habitats, and people in recreational areas is competition for prized locations. In each case, something or someone competes for a location: farmers for best crop-growing areas; businesses for accessible central locations; plants and animals for food, water, and optimum growing or living conditions; or people for best recreational locations.

Personal Space

Geographers and anthropologists recently have begun to explore human microspatial behavior through use of the concept of "personal space." This inquiry has been stimulated by ethologists' investigations of territorial behavior in animals which led to discovery of some commonalities among animal species. Higher animals within a given species have remarkably predictable distances at which flight or attack will occur when approached by an animal of another species. Many animals occupy fixed territories for extended periods of time. These territories act as places for reproductive activity, rearing of young, gathering of food, and refuge from hostile attack. Possession of the territory often depends on the animal's ability to defend it from the attack of others.

Human beings have abandoned many of the behaviors relating to territory, but some vestiges remain. Individuals are conscious of personal space when they withdraw their arms and legs, hold their heads rigidly straight ahead, and cease conversation in a crowded elevator, thereby demonstrating reluctance to come in contact with strangers. Hall has identified four distance zones which seem to define an appropriate interactional behavior: intimate, personal, social, and public.[8] He has derived a set of audiovisual criteria that humans use to define these interactive spaces. Intimate space can be defined as an interaction in which visual distortion of features occurs, in which normal speech seems loud, and in which distance is measured in inches. Examples would be the distance from lover to lover and mother to child. Personal space is the zone in which interactions with close friends occur. Visual distortion is still evident, voices seem loud even at moderate volume and distance ranges from one to three feet. Social space is exemplified by strangers meeting at a party. Visual distortion is minor, for the person's full figure is usually visible. Audio distortion does not occur over the typical social distance interval which ranges from three to ten feet. Public space involves the distance between speech-makers or lecturers and their audiences. Distances are so great that the speaker appears small and must shout to be heard without amplification; hence, both visual and audio distortion occur.

Geographers, city planners, and others have begun to apply such knowledge to designing social environments. As population and urbanization pressures constrict available space, it becomes more crucial to examine the character of human spatial interaction. For example, it is important to examine the size of optimal personal space for different cultures, since there seems to be clearly defined criteria which vary according to the culture examined. The Japanese, for example, find a paper screen separating one couple from another to be sufficient for the most intimate acts, while most Americans feel that a concrete wall is more appropriate. The exploration of the concept of personal space provides a new perspective for cross-cultural studies.

Time-Space Convergence

There are two ways to measure distance between points. One measurement is in absolute units of distance such as kilometers or miles, e.g., Boston is 4,800 kilometers (3,000 miles) from San Francisco. The other method uses relative criteria such as time, cost, or effort for stating the distance between points. In this case, the distance from Boston to San Francisco would be relative to the mode used to overcome the distance factor—walking, driving a car, taking a plane, or speaking on the telephone. Even though absolute distance remains a constant 4,800 kilometers, relative distance varies when we examine, for instance, the time involved to walk (four months), to fly (five hours), or to telephone (instantaneous).

Using the concept "relative distance" to analyze changes over time, we can show that the distance between any two points in the developed sections of the world appears to be shrinking, at least in relative distance terms. Geographers refer to this historically-viewed phenomenon by means of the concept of time-space convergence. We can measure this rate of the convergence of two places over time by comparing the time it took to travel between any two places at some period in the past with the time it takes today. The relative distance between these two points has shrunk precisely to the extent that travel time has diminished. For instance, the trip from Boston to San Francisco in 1849 took about 3,600 hours by wagon train or on foot; today, a jet plane traverses the same absolute distance in about five hours. Thus, the two places have converged upon each other enormously in terms of relative space.

This finding that places are converging on each other pertains at many different scales, or levels. The distances of our daily travel to school, work, shopping or recreation are shrinking in relative terms, although some metropolitan regions have grown so rapidly that traffic congestion and inadequate highways may have actually increased relative distances in some cases. In general, however, the whole of any metropolitan area can be an opportunity for inquiry into the process of time-space convergence. Predictions for the future of time-space convergence in metropolitan regions are extremely interesting. Some predict a time when space will be virtually overcome as a barrier to communication and movement. It is possible that many workers will no longer commute daily to employment, but rather will accomplish their tasks through other means of telecommunication. Such predictions aptly illustrate the ultimate convergence of time and space.

Teaching Selected Geographic Concepts

In the instructional modules on Valley City and Coyote Park outlined below we provide examples of sequent occupance, gradient, personal space, and time-space convergence and indicate how they can be explored through inquiry with elementary children. For secondary school students the same basic strategy can be used, but the discussion and application can be carried to greater detail and comprehension.

Module 1: Sequent Occupance in Valley City

Materials: Transparencies of maps of Valley City for 1925, 1950, and 1975 (Figs. 6.2, 6.3, 6.4).

Objective: Students will predict and verify land use changes in Valley City. Students will apply and explain the concept of sequent occupance to the historical development of their own community.

Activity: Show students the transparency of Valley City in 1950. Say: "This is Valley City about the time your parents were your age. What was Valley City like?" Encourage as many students as possible to respond. List their statements on the chalkboard.

Continue: "What do you think Valley City looks like today?" Ask students to explain their predictions. There are many possible suggestions that could be made relating to residential, commercial, industrial, transportation, and recreational land uses. Again, record their ideas on the chalkboard. If students don't incorporate a variety of ideas, help them to focus their thinking by asking questions such as, "Do you think the land near Red Creek is still unused?" "What conditions might retard or prevent its development?"

Distribute the map of Valley City in 1975 which reveals what Valley City is like today. Then ask these questions: "How did our predictions compare with what really happened? Is it always possible to verify predictions? Would it be possible to check our predictions if we made them about what Valley City was like in 1925 when your grandparents were your age? Why?" Answers will vary. Some students may think it is easier because Valley City was probably smaller while others may feel it would be more difficult because 1925 was so long ago

Divide the class into groups of three and ask each group to develop at least five "predictions" they have about what Valley City was like in 1925. Have the groups share ideas. Then show the students the map of Valley City in 1925. Have them verify their "predictions." How accurate were they?

Now ask, "Could you make predictions about the year 2000? Could you verify them? Why or why not?" Have the class examine the data for Valley City in 1975. "What do you think Valley City will be like in 2000 when your children will be in school?" Encourage the students to explain each idea as you record it. Refer to them as study progresses and further information becomes available. If feasible, invite a city planner to discuss their ideas with them.

Transfer: Replicate this activity for your community. Sources of data might be census tract data, city planning offices, museums, old newspapers, historical societies, interviews with residents, etc.

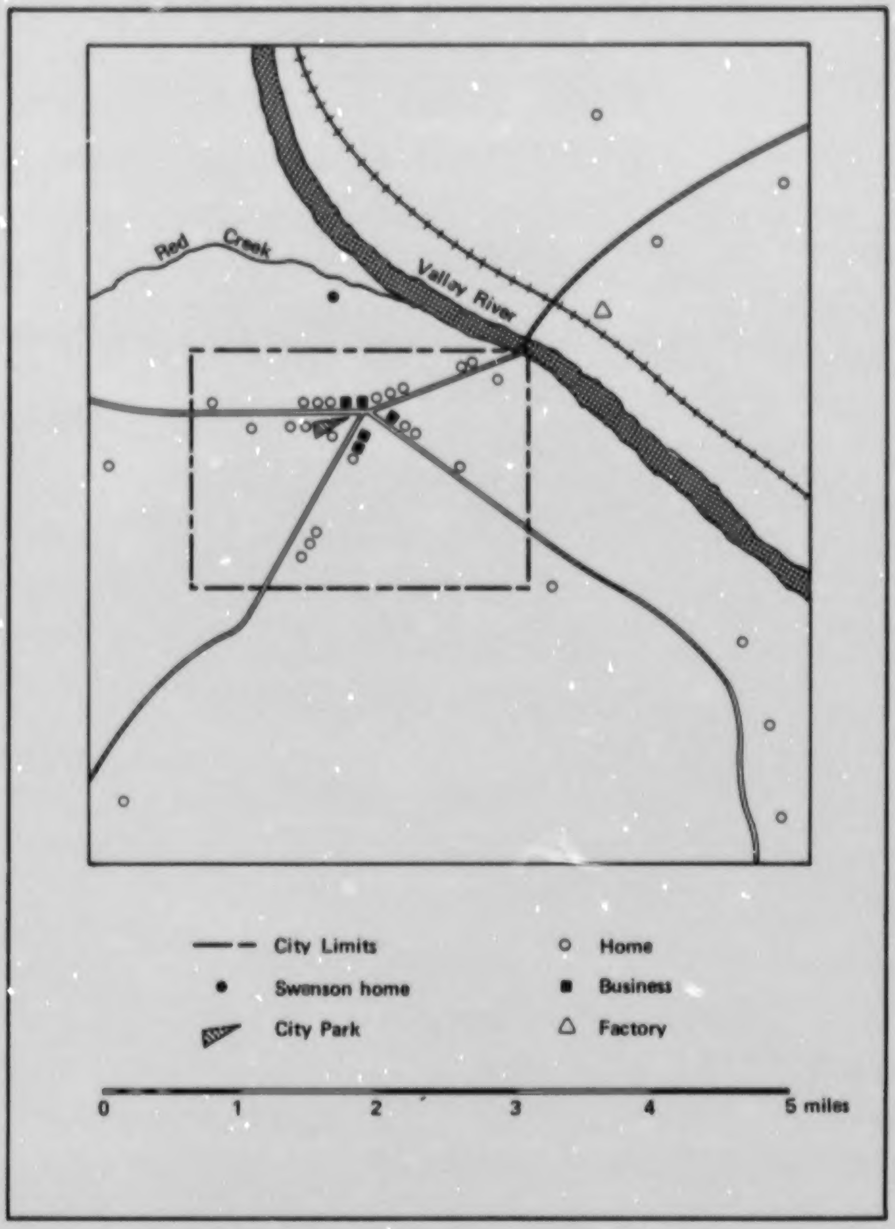
Red Creek
Valley River
City Limits
Swenson home
City Park
Home
Business
Factory
0
1
2
3
4
5 miles

Figure 6.2. Valley City in 1925.

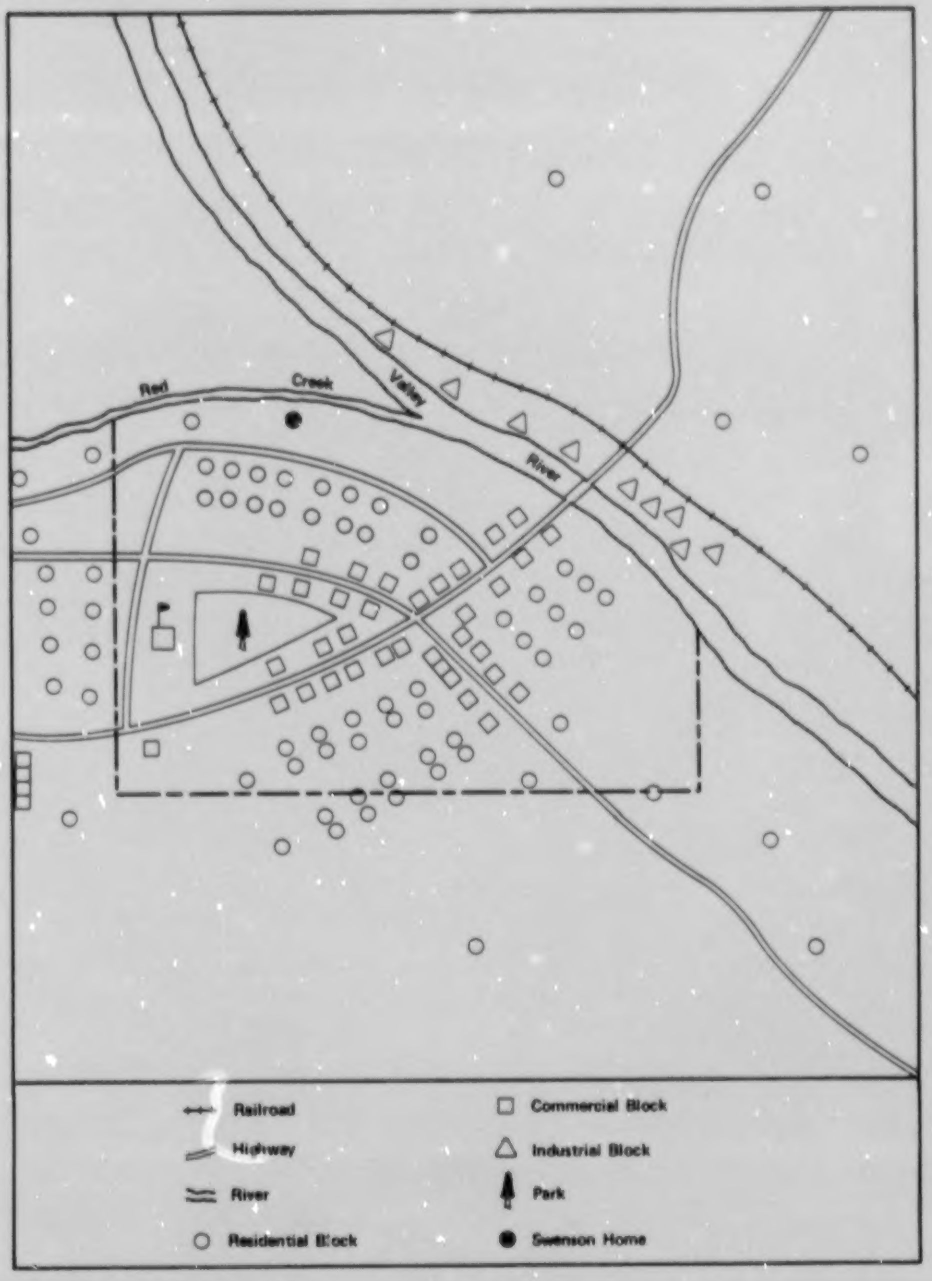
Red Creek
Valley River
Railroad
Highway
River
Residential Block
Commercial Block
Industrial Block
Park
Swenson Home

Figure 6.3. Valley City in 1950.

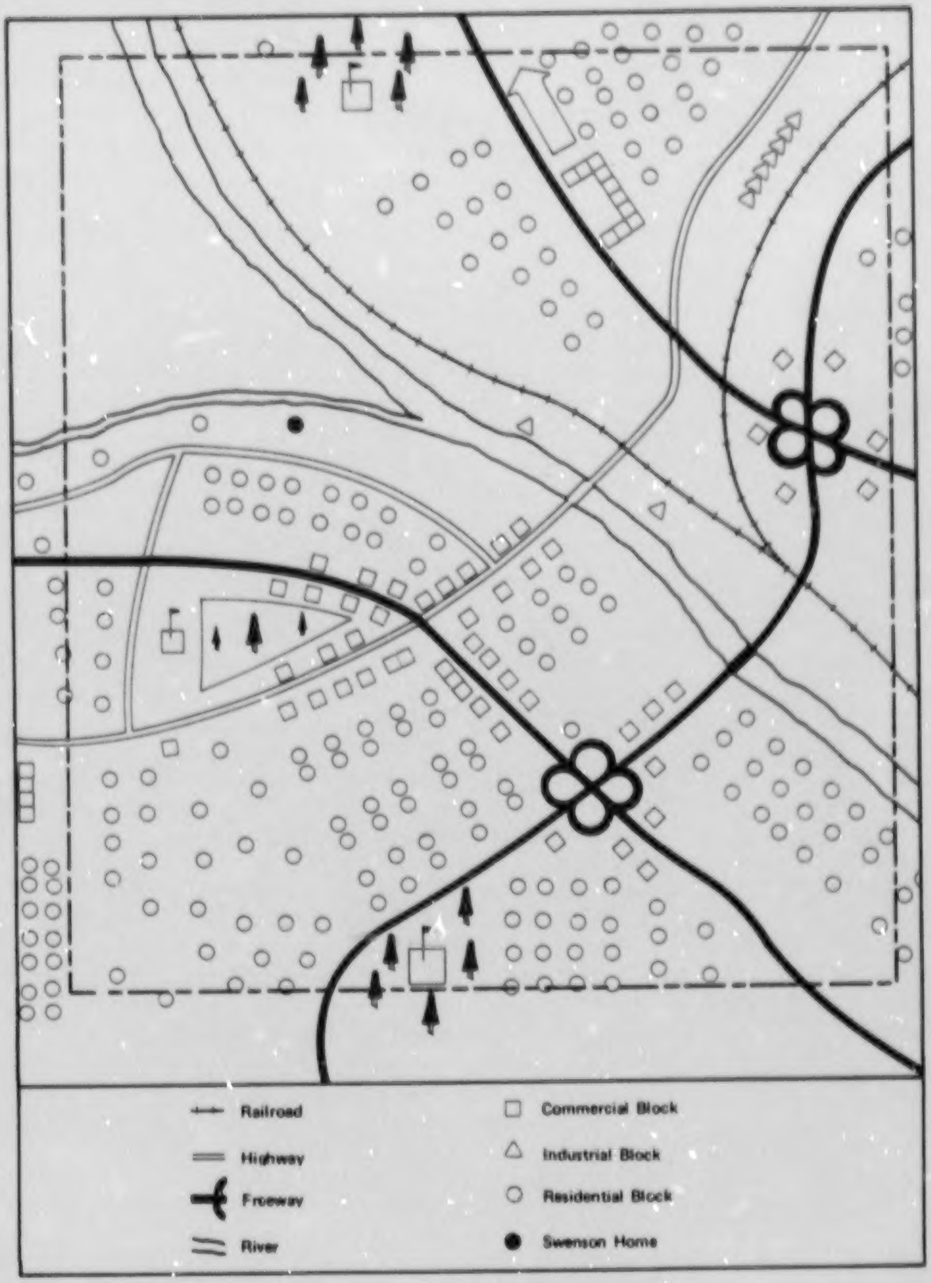
Railroad
Highway
Freeway
River
Commercial Block
Industrial Block
Residential Block
Swenson Home

Figure 6.4. Valley City in 1975.

Module 2: Personal Space in Valley City

Materials: Transparencies of maps of Valley City for 1925, 1950, 1975 (Figs. 6.2, 6.3, 6.4).

Objective: Students reflect another's feeling for personal space by participation in a role-playing or debate activity. Students will apply the concept of personal space to other situations familiar to them.

Activity: Begin the class by saying: "Today we're going to examine a single family that lives in Valley City. Mr. Swenson has lived here all his life. He and his wife moved into their house in 1925. (Show transparency of map of Valley City for 1925 and identify Swenson home.) "Why do you think they chose to live there?" Briefly discuss the question and record answers on chalkboard.

Now show the class the transparency of the map of Valley City for 1950 and ask, "How has the Swensons living environment changed?" Then repeat the process for 1975. Now the Swensons are considering moving into another house. (Identify it on the 1975 map.) Why might they want to move? What do you think they should do?

Divide the class into groups of five. Each group might discuss whether the Swensons should move. Each group might select one person to be Mr. or Mrs. Swenson and this individual will debate why they should move or stay where they are.

Conclude the lesson by reassembling the class and asking, "Do any of you feel that one of the reasons for moving is a need for more personal space?"

Transfer: Students in the class could duplicate this activity based on personal family moving experiences. Or they could interview their parents and report on the reasons why they have moved within the community.

Module 3: Time-Space Convergence in Valley City

Materials: Transparencies of maps of Valley City for 1925, 1950, and 1975 (Figs. 6.2, 6.3, 6.4). Transparency of Valley City Time-Space Convergence (Fig. 6.5).

Objective: Students will be able to examine a problem, offer a tentative solution to the problem, and determine if their solution is appropriate. Students will apply the concept to other situations known to them.

Activity: Begin this class period by saying: "Today we are going to look at the Swensons' shopping patterns. Look at the diagram. The various points show where the Swensons have shopped over time. First the family shopped at A. (Overlay 1925 transparency with Valley City Time-Space transparency.) Then they began to shop at B. (Overlay 1950 transparency with Time-Space transparency.) Mrs. Swenson says that it doesn't take any longer to get to C than it used to when they shopped at A or B. Why is this so? Why do you think the family shops at C when it is so far away? Allow the students to hypothesize about the reasons either as a large group or in small groups. When they have shared their ideas, have them examine the sequent occupance maps to determine if they were correct.

Transfer: Ask the children who are interested to check with their families about where they shopped ten years ago and where they shop today. Share the data in class and make a map showing the shopping patterns for the class. Apply the concept of time-space convergence with respect to increasing distance for shopping for certain items.

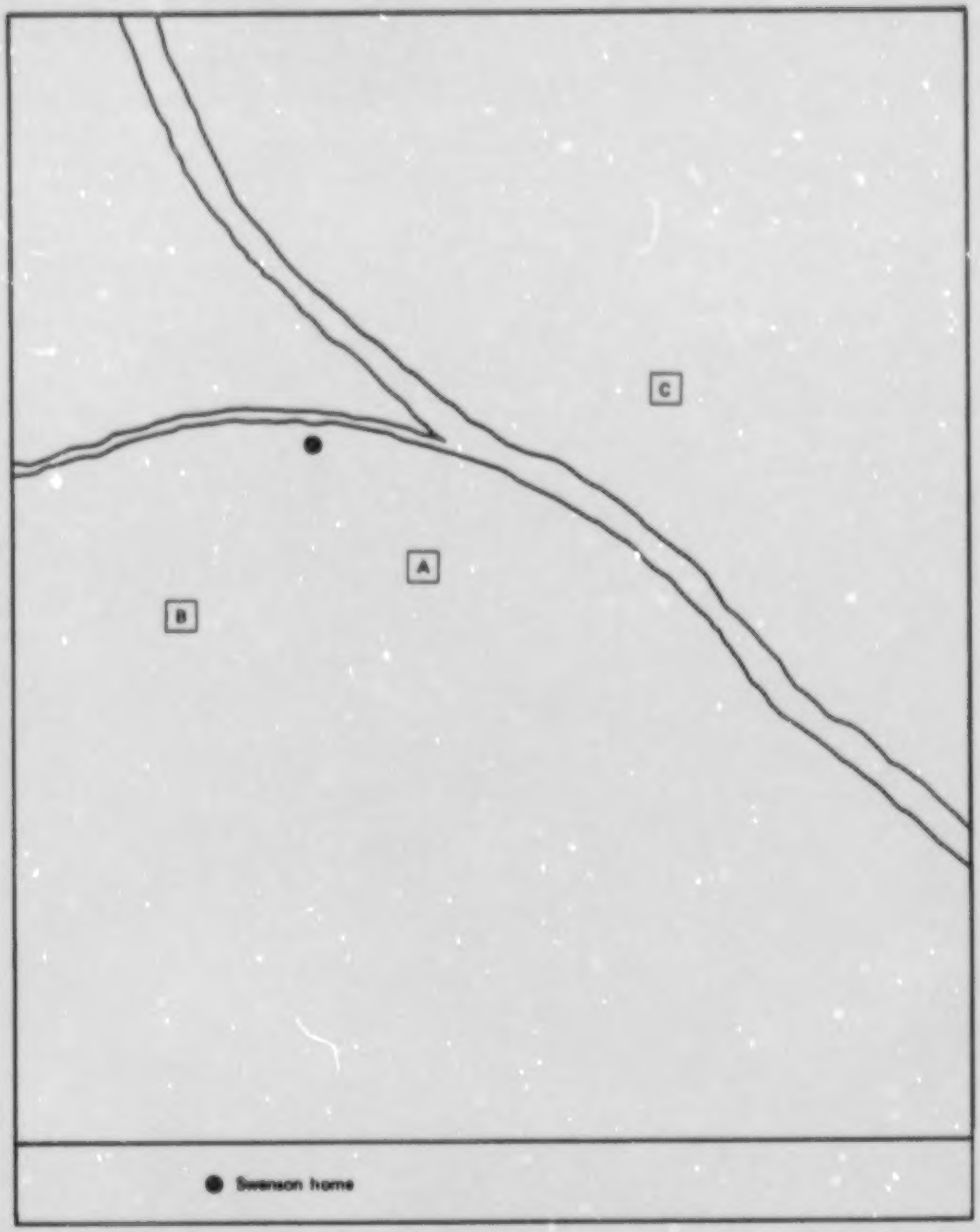
C
A
B
● Swenson home

Figure 6.5. Valley City: Time-Space Convergence.

Module 4: Population Density Gradient in Valley City

Materials: Transparencies of the maps of Valley City in 1925, 1950 and 1975 (Figs. 6.2, 6.3, 6.4). Transparency of Valley City Gradient Zones (Fig. 6.6).

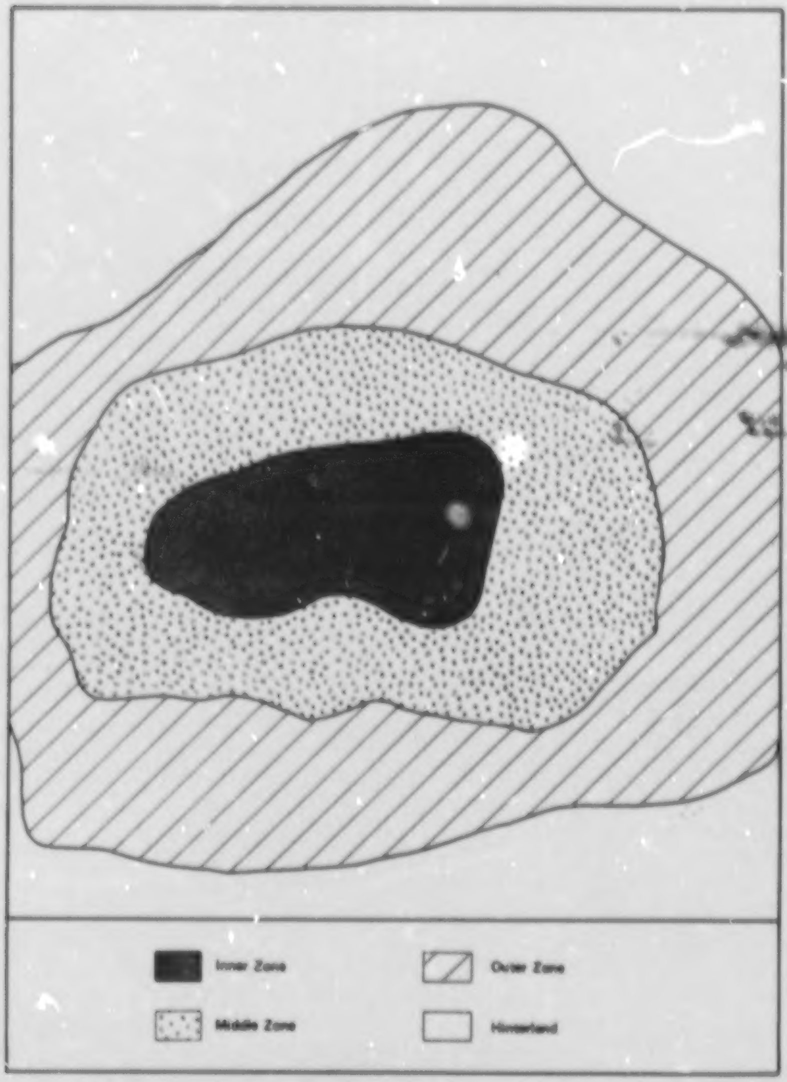
Inner Zone
Outer Zone
Middle Zone
Hinterland

Figure 6.6. Valley City: Gradient zones.

Objective: Students will be able to state the changes in population density gradient for Valley City, 1925-1975. Students will apply the principle of density gradient to other situations known to them.

Activity: Begin by showing the transparency of the map of Valley City in 1925. Ask: "Where did most of the people live in 1925? Why?" Next show the transparency of the map of Valley City in 1950. Ask: "Where did most of the people live in 1950? What changes occurred from 1925 to 1950? Why do you suppose this happened?" Now show the transparency of the map of Valley City in 1975. Ask: "Where do most of the people live now? What has happened in the last twenty-five years? Where is it most crowded? Least crowded? Why?"

Now place the transparency of Valley City Gradient Zones over the transparency of the map of Valley City in 1975. Explain to students that this figure shows where there are many people per square mile as well as fewer people per square mile. Tell them that population density answers the question, "How many people per square mile (or kilometer)?" Now ask the class, "Are there more or fewer people per square mile in the center of Valley City than on the edge? What is the average population density for the Outer Zone? What happens to population density away from the center of Valley City?"

Transfer: The students could make transparencies of their own community over time. Then they could examine the zones in similar fashion. This could lead to prediction and generalization about what is happening in communities around the nation.

Module 5: Sequent Occupance in Coyote Park

Materials: Transparencies of the maps of Coyote National Park before the Indian occupance (Fig. 6.7), before the Caucasian occupance about 1700 (Fig. 6.8), after a series of exploitative occupances in the 1920s (Fig. 6.9), and Coyote National Park today (Fig. 6.10). Transparencies and copies of the table of culture and landscape data (Table 6.1).

Objectives: Students will identify similarities and differences among the maps of the different time periods and formulate hypotheses to explain the differences occurring in the natural landscape.

Students will verify or reject their hypotheses through examination of the relationship between cultural group characteristics and inferred landscape changes.

Students will choose the landscape period that they like best and defend their preferences.

Activity: Begin by reproducing the various map symbols on the chalkboard. Ask: "What does each of these mean? Are they good symbols for what they represent? Why or why not?"

Now divide the class into small groups. Have one-half of the students look for similarities among the four maps. Have the other half seek differences. "What similarities and differences did you find?" List these on the chalkboard.

Next ask: "Can you guess why there have been changes in the sizes of the vegetation areas on the maps?" List every student hypothesis on the board provided the student can defend his idea. Ask: "What must we find out in order to verify our hypotheses? How can we discover which are correct and which are incorrect?"

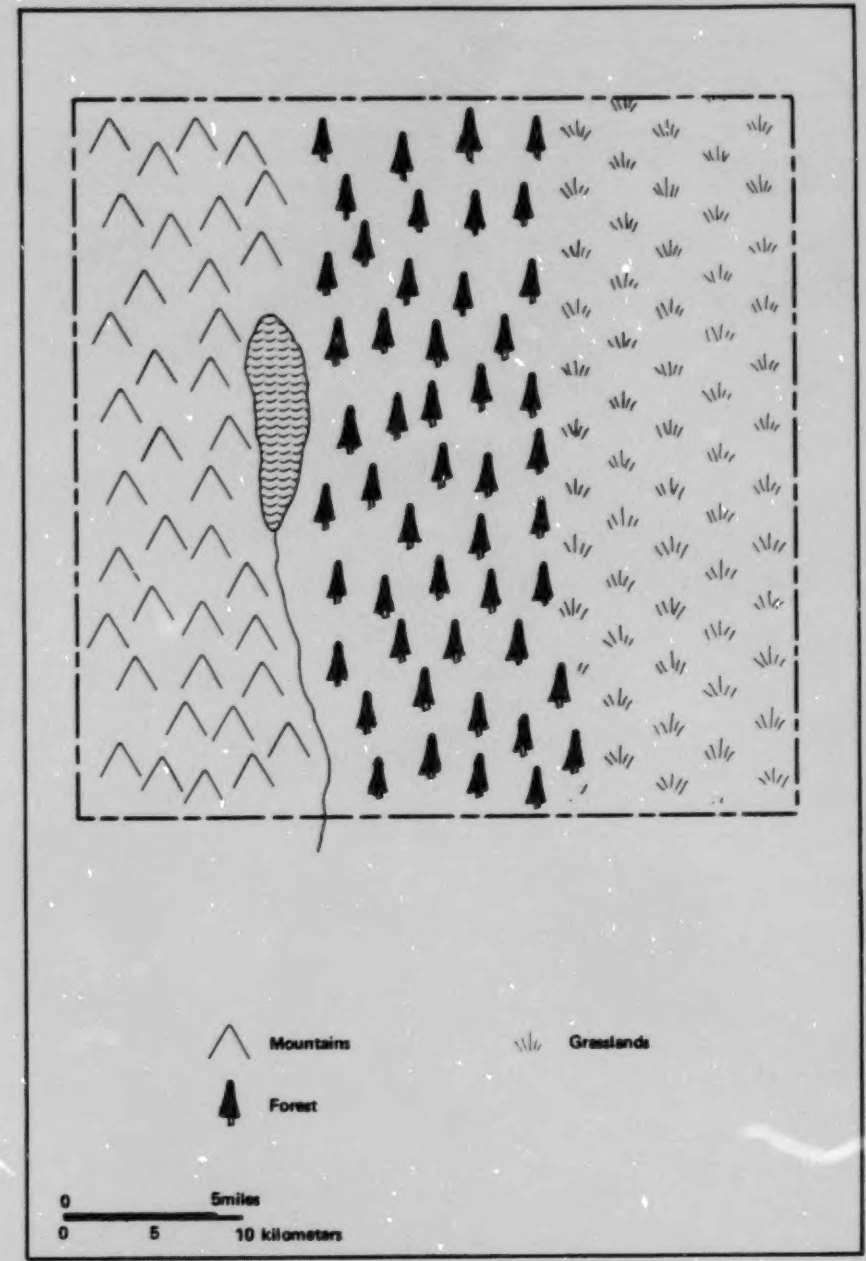
Mountains
Forest
Grasslands
0
5miles
0
5
10 kilometers

Figure 6.7. Coyote National Park before Indian occupance.

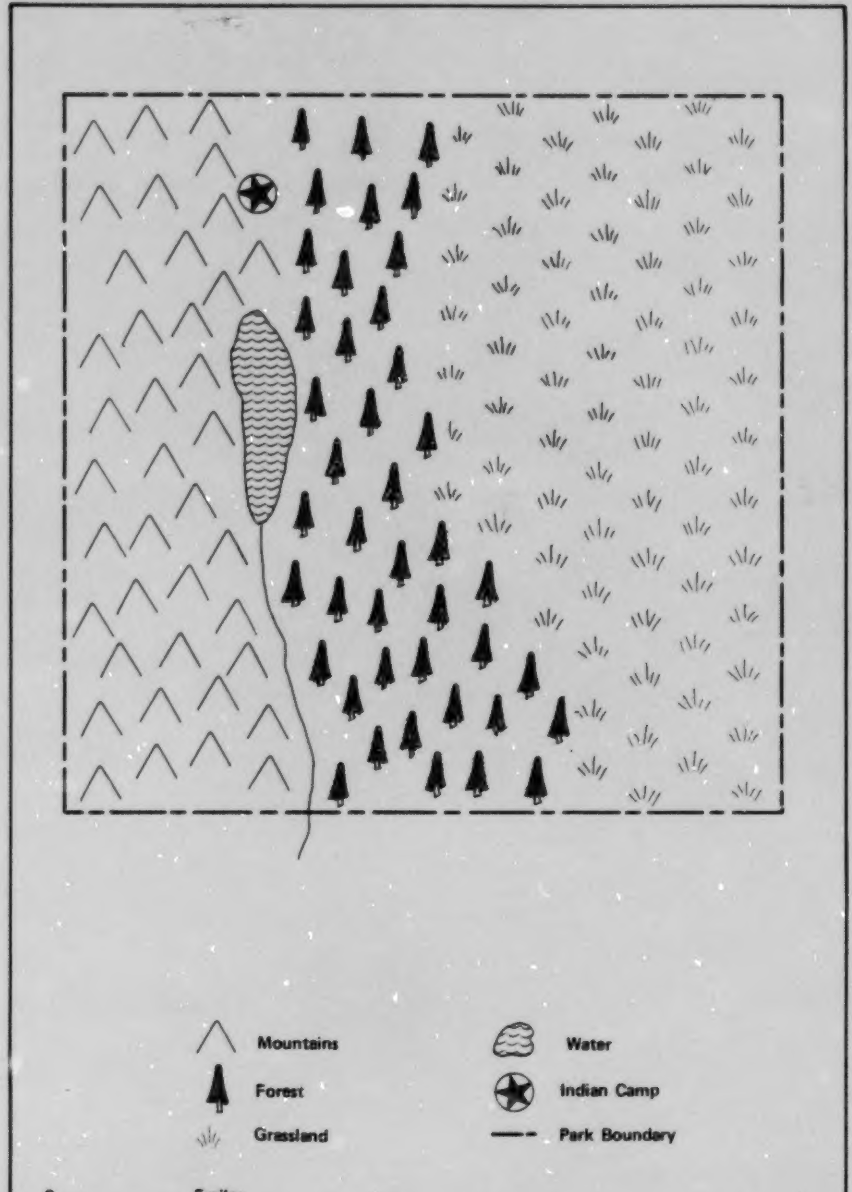
Mountains
Water
Forest
Indian Camp
Grassland
Park Boundary
0
5miles
0
5
10 kilometers

Figure 6.8. Coyote National Park about 1700.

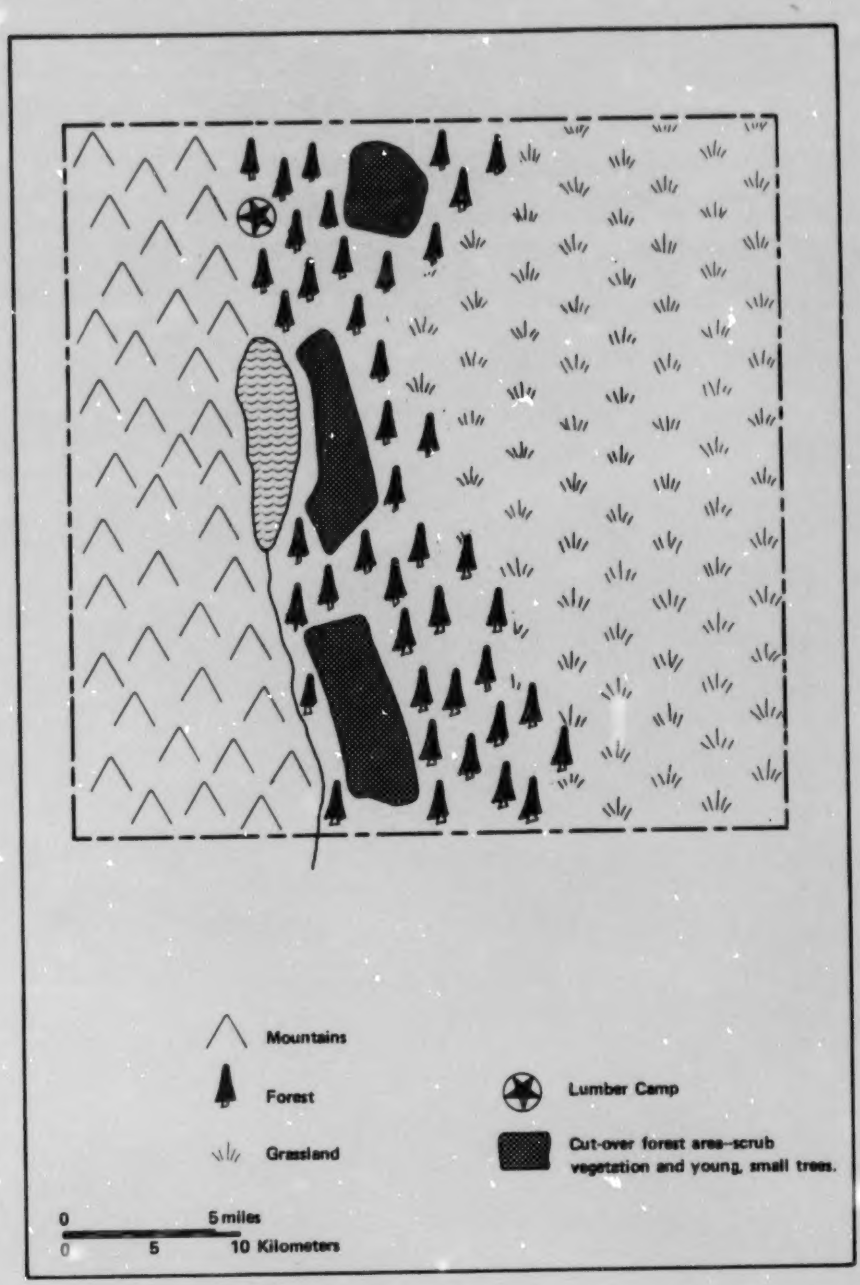
Mountains
Forest
Grassland
Lumber Camp
Cut-over forest area--scrub vegetation and young, small trees.
0
5 miles
0
5
10 Kilometers

Figure 6.9. Coyote National Park, 1925.

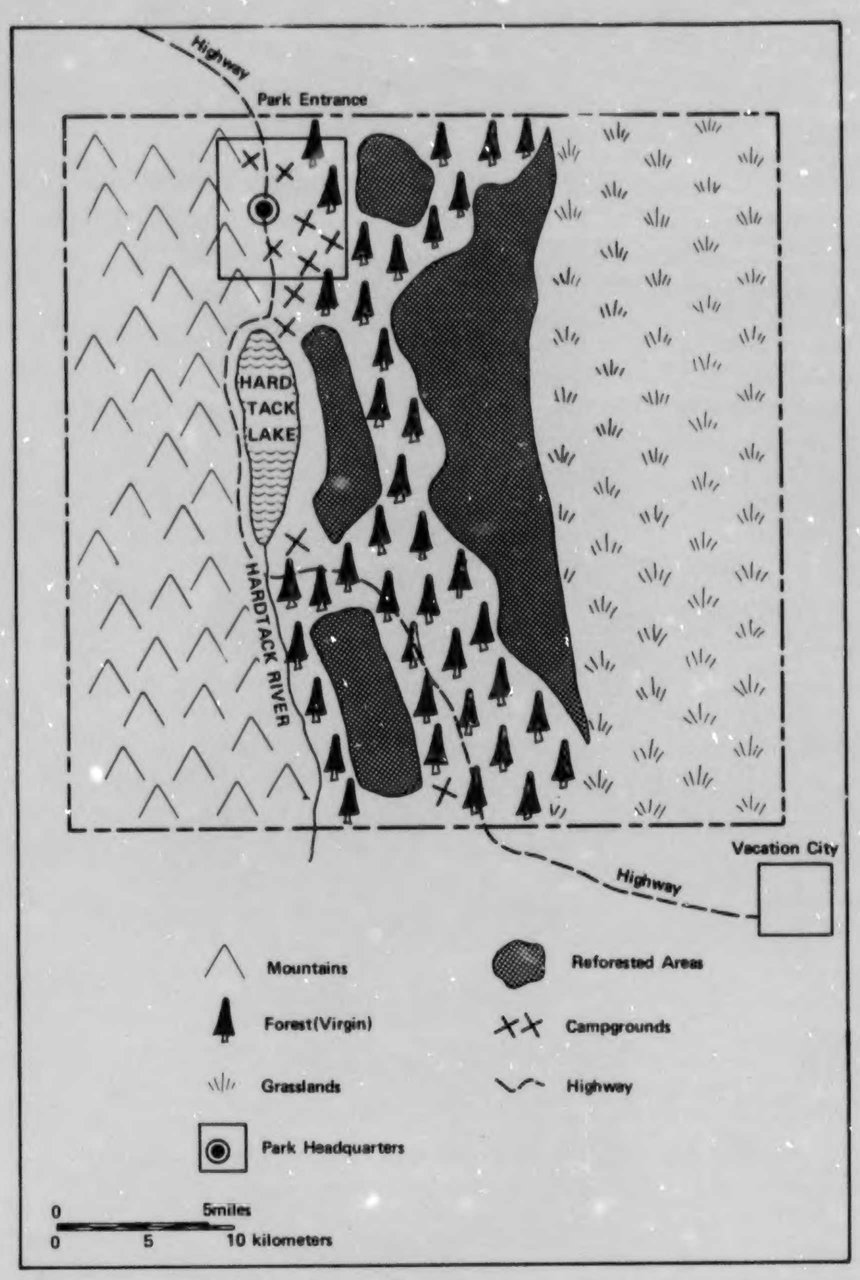
Highway
Park Entrance
HARD TACK LAKE
HARDTACK RIVER
Vacation City
Highway
Mountains
Reforested Areas
Forest(Virgin)
Campgrounds
Grasslands
Highway
Park Headquarters
0
5miles
0
5
10 kilometers

Figure 6.10. Coyote National Park, 1975.

TABLE 6.1
Culture and Landscape Data

Time Period	Tools	Techniques	Purpose	Vegetation (%)	Animals
Before Man				Mountain Meadow 25 Forest 50 Grassland 25	Deer 100 Bear 100 Buffalo 100 Moose 100
1700–Indian Occupance	Bow and Arrow Fire Horse	Carving, flint into arrowheads, hunting Starting, driving off animals Riding, herding, trading	To survive in a rich environment that provides for every need	Mountain Meadow 25 Forest 45 Grassland 35	Deer 90 Bear 95 Buffalo 90 Moose 95
1920s–End of Lumbering Occupance	Axe Crosscut Saw Spiked Boots Oxen Fire	Top and trim trees Fell trees Climb trees Haul logs out of forest Burn the slash in cutover areas Clear-cutting in forest	To cut as many trees as possible in as little time as possible in order to make a profit	Mountain Meadow 30 Forest 25 Grassland 45	Deer 60 Bear 50 Buffalo 0 Moose 20
1975–National Park Occupance (50 years)	Park Rangers: Shovels Fire Watchtowers Knowledge Visitors: Camping Equipment Automobiles Binoculars Cameras Hiking Boots	Plant trees Spot forest fires Improve animal living areas and maintain or increase their numbers Pursue outdoor sports View scenery Solitude in a beautiful place	Rangers are to preserve and improve a natural landscape Visitors want to enjoy themselves and be outdoors	Mountain Meadow 25 Forest 40 Grassland 35	Deer 110 Bear 70 Buffalo 20 Moose 5

Introduce the chart of additional data. Call the students attention to the columns labeled Vegetation and Animals. Ask: "Do the numbers of animals and percentages of vegetation types on ths chart agree or disagree with the symbols on the maps? Does one kind of data (e.g., tables vs. maps, etc.) tell us more about the area than another? Why or why not?" For instance, the students might note that changes in the numbers of various species of animals might not be shown easily on the maps.

Have students reexamine the chart. Discuss the Tools, Techniques, and Purpose columns. Ask: "What new information does this add to what we have already discussed and shown on the chalkboard? Can we add any additional information to these columns?"

Ask: "Do we have enough information now to confirm or reject our original ideas about why the landscape changes with each group that occupies it? What techniques did the Indians use that might have changed the amount of forest land? (This type of question could be asked for each group and each of the three columns.)" Discuss the material until some determination has been made on each original hypothesis.

Have the students list all of the features shown in the map of Coyote National Park (Fig. 6.10). Ask: "How much has the landscape changed in the last 50 years? Do you think these changes have been beneficial? Why or why not? Whom did they benefit? Is that a good idea?" Children could also relate their own experiences in national parks or recreation areas. You might also ask: "During which period would you most like to have lived in this area? Why?"

As part of the review of this activity, ask students: "What change in the landscape do you think was most important in each period? Why?" There will be diversity in responses. Accept them as given, provided that the student can defend his answer with reasons for his choice.

Transfer: Have the students select a local park area or a national park of interest. Have them research similar data for the park and examine the environmental impact of the various occupance groups.

Module 6: Time-Space Convergence in Coyote Park

Materials: Transparency of map of Coyote National Park today (Fig. 6.10).

Objective: Students will calculate the distance between Vacation City and National Park Headquarters, identify alternative means of transportation, and estimate the travel times between these two points. Students will apply the principle of "shrinking space" to other situations known to them.

Activity: Introduce the activity by focusing students' attention on Valley City's economic functions. Ask: "Why do you think Vacation City exists? What might people want before entering the park?"

Next shift their attention to distance. Ask: "How far is Vacation City from National Park Headquarters? (Students can calculate the distance using the scale of miles.) How long do you think it takes to go to park headquarters by car from Vacation City? How long do you think it might have taken someone to walk this distance some years ago? What are some other modes of transportation that people might have used in the past? What means of travel might be used in the future?" List the responses of the students on the board in the order from slowest to fastest. Ask: "Which means of transportation would encourage the most people to travel through the park? Why?"

Transfer: Students will give at least five examples of places that seem to have grown closer in distance because of the diminishing travel time through examining other situations that have similar patterns. These might be the distance from their community to a nearby city via a new freeway or the comparative times to travel to the nearest large metropolitan area by varying means of transportation.

Module 7: Population Density Gradient in Coyote Park

Materials: Transparency and copies of diagram showing Coyote National Park Headquarters (Fig. 6.11).

Objective: Students will identify the areas of highest camping density in Coyote National Park, and formulate hypotheses explaining why the higher camping densities occur nearest to park headquarters.

Activity: Give each student a copy of Figure 6.11. Divide the students into small groups and ask them to examine the number of areas set aside for auto camping and for hiker camping. Also have the students observe how many camping families can camp in each area. Ask each group to determine where most people would camp and why. Discuss the group responses and record them.

Ask: "Why do you suppose the park staff has located campsites so densely around camp headquarters? Why have more not been located further away? How do you think we could find out the answers?" List the range of responses on the board and discuss the relationships between visitor facilities, proximity of campsites to facilities, and density gradient of campers from the facilities outward.

Transfer: Obtain maps of state parks or national recreation areas. Examine the density of camping areas in these parks. What generalizations can the student make about the nature of camping areas in parks based on the additional data? Does it support their hypotheses?

Module 8: Personal Space in Coyote Park

Materials: Copies of "Some Suggestions Made by Park Visitors for Park Improvement."

Objective: Students will demonstrate their awareness of others' needs for personal space by analyzing sample statements of park visitors. Students will apply the concept of personal space to some aspect of their local community.

Activity: Explain to the students that they are going to assist the head park ranger in deciding on some changes in Coyote National Park based on visitors' comments. Now distribute copies of "Some Suggestions Made by Park Visitors for Park Improvement" and have students read the list.

Some Suggestions Made by Park Visitors for Park Improvement

1. Don't let so many people camp in the campgrounds. Our tent was only two feet from someone else's—we had no privacy at all.

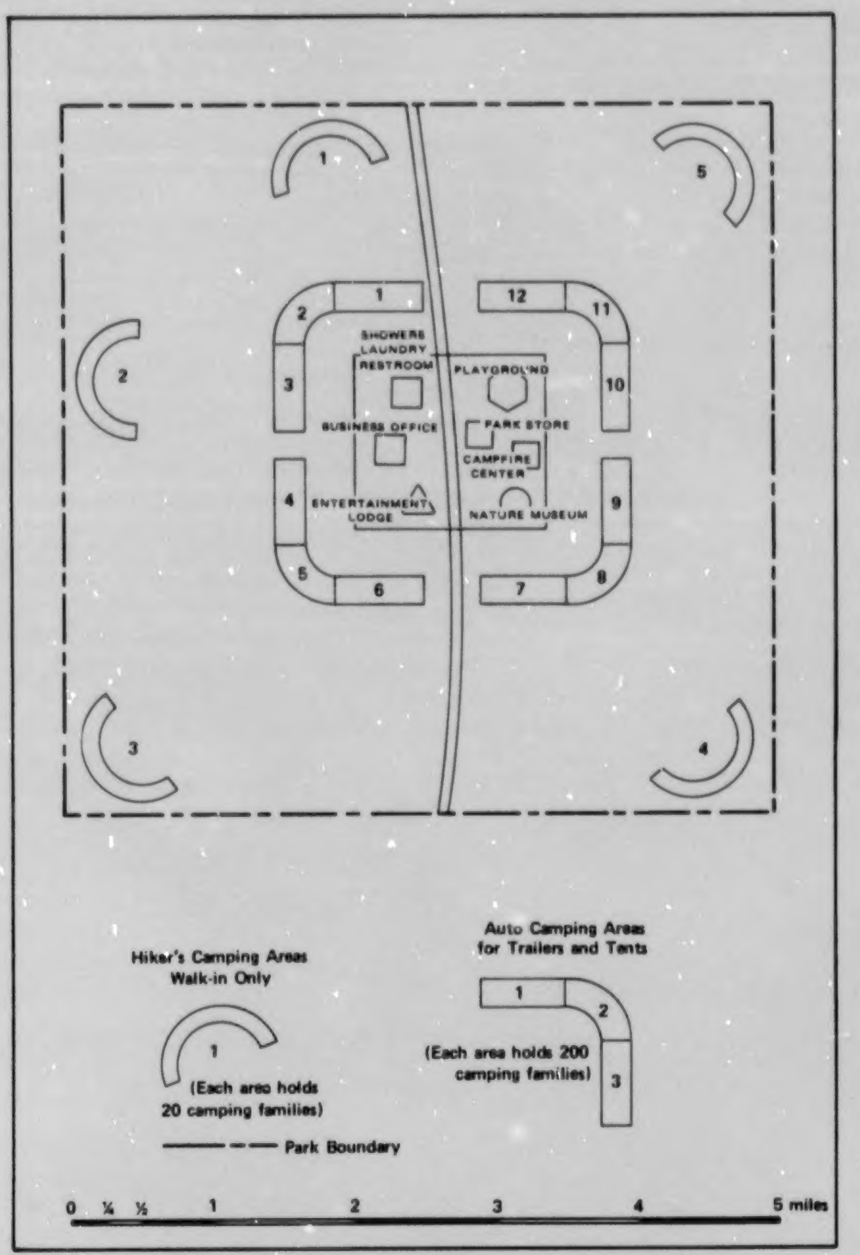
1
5
2
3
4
1
2
3
4
5
6
7
8
9
10
11
12
SHOWERS
LAUNDRY
RESTROOM
PLAYGROUND
BUSINESS OFFICE
PARK STORE
CAMPFIRE CENTER
ENTERTAINMENT LODGE
NATURE MUSEUM
Hiker's Camping Areas Walk-in Only
1
(Each area holds 20 camping families)
Auto Camping Areas for Trailers and Tents
1
2
3
(Each area holds 200 camping families)
Park Boundary
0
¼
½
1
2
3
4
5 miles

Figure 6.11. Coyote National Park headquarters.

2. Parents should keep their small children and babies from wandering in other people's campsites.
3. Don't allow so many people at once to fry fish on the shore of Hardtack Lake. Our family could hardly cast a line because it was so crowded.
4. We went on a hike into the mountains southwest of Park Headquarters and found almost as many people on the trail up to Mount Blank as back in the campground. We aren't coming back to Coyote Park!
5. I couldn't get to sleep last night in the campground, for there was so much noise around me. I came here for peace and quiet, but there seem to be more people here than at home!

Ask: "How are all of these suggestions alike? What is really bothering these people? What can be done to eliminate these problems? What would you do as the head ranger? Why?" List the solutions and have the students discuss their practicality. They should be able to see that most of these are related to perceptions of personal space.

Transfer: The students could make up a simple survey that could be given to adults and children that they know. The results could be compiled and examined. The survey could relate to space needs in recreation areas, in apartments if this is in an urban area, or similar topics.

Concluding Remark

The authors have attempted to present a realistic and practical model for inquiry in classroom settings and to provide a number of examples of applications of that model. It is hoped that you will explore with your students the concepts of sequent occupance, gradient, personal space, and time-space convergence by using some of these ideas. More important, however, is the extension of the model to new concepts and the development of new activities by people like you for your students. An inquiring mind is one of the most important legacies of schooling, but it does not develop without such efforts on your part.

NOTES

1. Barry K. Beyer, *Inquiry in the Social Studies Classroom: A Strategy for Teaching* (Columbus, Ohio: Charles E. Merrill Publishing Co., 1971).
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3. Hilda Taba et al., *A Teacher's Handbook to Elementary Social Studies,* 2nd ed. (Reading, Mass.: Addison-Wesley, 1971).
4. Jan O. M. Broek, *Geography: Its Scope and Spirit* (Columbus, Ohio: Charles E. Merrill Books, 1965).
5. John M. Ball et al., *The Social Sciences and Geographic Education* (New York: John Wiley & Sons, 1971).
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7. Robert C. Lucas, "The Recreational Capacity of the Quetico-Superior Area," Lake States Forest Experimental Station, Forest Service, U.S. Department of Agriculture, 1964.
8. Edward T. Hall, *The Hidden Dimension* (Garden City, N.Y.: Anchor Books, 1969).

7

Teaching Geography Through Exposition

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An important task for any geography teacher is the selection of an appropriate teaching strategy to attain the goals of geographic education. A basic postulate of this paper is that the method by which content is organized and taught will determine the degree to which that content is learned.[1] The purpose is the exploration of the expository teaching strategy. Exposition refers to a strategy in which the teacher presents the learner with a symbolic message. The learner receives and accommodates the message, i.e., he/she learns it. Interaction between the teacher and student is usually minimal. In the inquiry strategy, the teacher provides data and materials, arranges them in ways which will encourage insights, and asks questions likely to generate concepts and generalizations. The learner observes and manipulates data and attempts to discover important ideas.

Whereas exposition is practical and relatively easy to implement, pure and continuous inquiry is difficult and few teachers are capable of organizing instruction which is entirely inquiry-oriented. Helping learners make observations, ask questions, form hypotheses, and state conclusions, while allowing them to gather *their own* evidence and draw *their own* conclusions from that evidence is obviously not an easy task. Exposition is efficient because it allows the teacher to "cover" a large amount of content in a relatively short time, whereas inquiry is less efficient because it takes considerable time to "cover" a similar amount of content. However, exposition's effectiveness is often challenged because there is no guarantee that a passive learner receiving a symbolic message is actually learning. Inquiry, by comparison, appears more effective because the learner interacts with content overtly and presumably demonstrates some degree of understanding while discovering concepts and relationship patterns which exist.

Despite recent acclamations about the benefits of teaching through inquiry, it may be safely asserted that most classroom instruction continues to be carried out with some form of expository teaching—lecturing, textbook reading, or film viewing. Numerous educators have praised inquiry strategies and lamented that "teachers do too much telling" and "students do too little discovering."[2] Yet exposition persists.

Why? We believe it is because teachers have found the expository method is appropriate for obtaining certain significant learning objectives.

To understand expository teaching it is necessary to distinguish between *meaningful* learning and *rote* learning. Meaningful learning refers to that learning which can be related in a nonarbitrary fashion to what the learner already knows and which allows the learner's previously acquired knowledge to function as an organizational framework for internalizing and making understandable new concepts and propositions.[3] Rote learning, on the other hand, is that learning which consists of purely arbitrary association. It results when the learner learns potentially meaningful material in an arbitrary and verbatim manner or when the learning task itself is inherently arbitrary, e.g., memorizing a list of random numbers. Bloom reports an anecdote involving John Dewey which illustrates the problem of rote learning. Dewey asked a group of elementary school children: "What would you find if you dug a hole in the earth?" Receiving no response, he repeated the question and again obtained nothing but silence. The teacher chided, "You're asking the wrong question." She asked the group, "What is the state of the center of the earth?" The class replied in unison, "Igneous fusion."[4]

Anchoring Ideas

Meaningful learning is based on understanding concepts and principles rather than memorizing information. Facts facilitate meaningful learning but in a classroom oriented to meaningful learning development of a useful and meaningful conceptual framework is the principal teaching task. One important influence on the learning and retention of potentially meaningful concepts is the availability of relevant anchoring ideas in the learner's cognitive structure. Relevant anchoring ideas may be defined as unambiguous, stable abstractions that provide optimal relatability of more specific concepts and generalizations. Anchoring ideas can function as "structural scaffolding" for curriculum development, as starting points for instruction, or as content to be taught and learned explicitly. Here are two examples of anchoring ideas drawn from geography.

Scale as an Anchoring Idea

Most elementary social studies programs reflect the expanding environment theory which advocates that young children should begin their schooling by studying their immediate environments; only later should they learn about distant places and people, thus extending their spatial and social perspectives. In kindergarten or first grade, for example, the child might study the family and the home. In the second grade, the environment is expanded to the school and local community. Sequentially, the learner is introduced to the state, nation, western hemisphere, and, usually by the sixth grade, he is considering various dimensions of the world.[5] Skeel has criticized the expanding environment approach, pointing out that mass media and increased travel have given children a broader exposure to phenomena other than those in their immediate environment.[6] Numerous studies suggest, however, that the expanding environment sequence actually complements a human developmental sequence.[7]

Whatever the merits of the expanding environment approach to curriculum design, it does suggest a powerful anchoring idea—*scale*. *Scale* is usually defined as the relationship between earth-distance and map-distance and permits picturing, measuring, and reducing earth space in a conceptualized package—the map. Although geographers are rarely interested in explaining the spatial pattern of crystals in a snowflake or the pattern of planets in a solar system, they are concerned with human and physical considerations at several immediate scales or sides of geographic magnitude; therefore, a multiple-scale approach is an important element in developing a geographic perspective.[9]

At least six scales seem appropriate for geographic education: continental or regional, national or subcontinental, sectional or state, urban or city, neighborhood or community, and family or household. Students versed in the recognition and use of different scales begin to realize that some concepts and generalizations useful at one scale are not useful at another scale while other concepts and generalizations are useful at all scales. For example, urban concepts such as central business district, ghetto, and peak land value intersection are large-scale concepts applicable only to the urban or city scale. In contrast, climatic concepts, such as monsoon and humid subtropical, and terrain concepts, such as plateau and plain, are most appropriate at a regional or continental scale. Finally, some concepts such as agglomeration, spatial interaction, and functional region are appropriate at various scales.

Concepts from different levels of analysis can also be related through a scale approach. For example, weather and climate can be differentiated on the basis of place and time. Weather can refer to the condition of the atmosphere at a local place at a particular time, e.g., "The weather in Chicago this afternoon is . . .," while climate can refer to average weather patterns across regions and continents over extended periods of time, e.g., "The climate of the Great Lakes region is . . . ." Climate is a small-scale, macro-concept generalizing patterns across space and time whereas weather is a large-scale, micro-concept conveying more specific information about a particular place at a particular time.

Spatial Interaction as an Anchoring Idea

Spatial interaction is the dynamic relationship between two or more phenomena on the earth—natural or human. The flow of the westerlies, the movement of a commodity, and the spread of an idea are expressions of spatial interaction. The unequal distribution of solar energy, moisture, and surface features causes air masses to interact and storm patterns to flow across the earth. In the realm of economic geography, spatial interaction results when regional specialization generates movement of goods or commodities between locations. Spatial interaction is apparent at every scale ranging from trips to the local shopping center to massive flows of Persian Gulf petroleum and North American wheat across the surface of the earth. The concept of spatial interaction has considerable breadth of application. In teaching about weather, climate, and air masses, the teacher could consider the dynamic aspects of the lower layer of the atmosphere where great fluxes of energy and matter occur, exemplified by the rapid change in temperatures effected with the advection of a polar continental (Pc) air mass into the middle latitudes of the United States in winter. Or the idea of spatial interaction might be emphasized in the study of Japan, for the Japanese have developed a highly complex industrial society based on importing raw materials and food, and "exporting" skilled labor in the form of high-value manufactured goods. Japan's global linkage system reaches around the world, and when one considers that new Japanese cars contain materials from older United States cars that have been "reprocessed" in Japan's steel mills, spatial interaction begins to take on real meaning.

In an economic sense the basic elements of spatial interaction are specialization, complementarity, and transferability.[9] Specialization refers to the fact that particular places specialize in particular products, e.g., the Corn Belt, Idaho potatoes, the Detroit automobile complex, Wenatchee Valley apples, Wall Street, and Dutch tulips. Complementarity occurs when the production advantages of two or more places lead to a mutually beneficial linkage. Transferability refers to the capacity to overcome the distance between places at a reasonable cost. If the cost of transfer between market and supply is too great, interaction will not occur because substitutions or intervening opportunities will replace or prevent trade, e.g., using bricks instead of wood, buying steel from Bessemer, Alabama rather than Chicago, replacing Washington state apples with Virginia apples.

Two Expository Teaching Techniques

The teacher planning an expository activity has two tasks. First, he/she must organize the content in a manner which is most likely to produce orderly and logical learning. Second, he/she must relate that content to the learner's cognitive structure in a manner that is likely to spark interest and motivation. Two expository teaching techniques—springboards and advance organizers—are useful in accomplishing both tasks. Springboards and advance organizers are similar in that both relate unfamiliar content to the learner's cognitive structure, but they differ in how they function psychologically. Springboards stress cognitive dissonance as a motivational factor whereas advance organizers provide a general inclusive structure for unfamiliar content by helping the learner recognize and internalize "big ideas" before studying more specific content.

The Springboard as an Expository Technique

A springboard is a concise idea, either a principle or a generalization, which enables the lecturer to gain entry into the learner's cognitive structure. Springboards may be designed to relate prior experiences of the learner, to motivate the learner, to establish cognitive dissonance within the learner, or some combination of these. The purpose of the springboard is to trigger the learner's imagination by presenting a statement that is surprising or dissonant. Effective springboards are usually controversial and generate considerable classroom discussion. Learners may exhibit total unfamiliarity with the springboard and agree with it or they may exhibit familiarity with the springboard and knowledgeably disagree with it.

The Distribution of China's Population: A Springboard Activity. In our first example of a springboard the population of China is investigated in steps beginning with a hypothetical uniform distribution and culminating in its actual differentiated distribution. Economic development, physical geography, and political decisions are employed as explanatory variables for population differentials between eastern and western China. The teacher builds an argument through the use of maps and substantiates the conclusion with data. As with most expositions using springboards, the teacher presents the information verbally and visually. Here is a synopsis of the presentation as it was made by one teacher.[19]

> Most people believe the population of the People's Republic of China is large, probably exceeding 700 million people, and dense, probably exceeding 200 people per square mile. This belief suggests the possibility that China is severely over-populated and has no empty areas. (Show Fig. 7.1.)
>
> If the distribution portrayed in Figure 7.1 is accepted as correct, then several assumptions about China are possible:
>
> 1. China lacks urban agglomerations and the economic development associated with urban areas.
> 2. All areas of China are equally well suited for agricultural production.
> 3. Major topographic differentiation is absent in China.
> 4. Climate is rather uniform across China.
>
> Let's consider economic development first. The majority of China's industries are

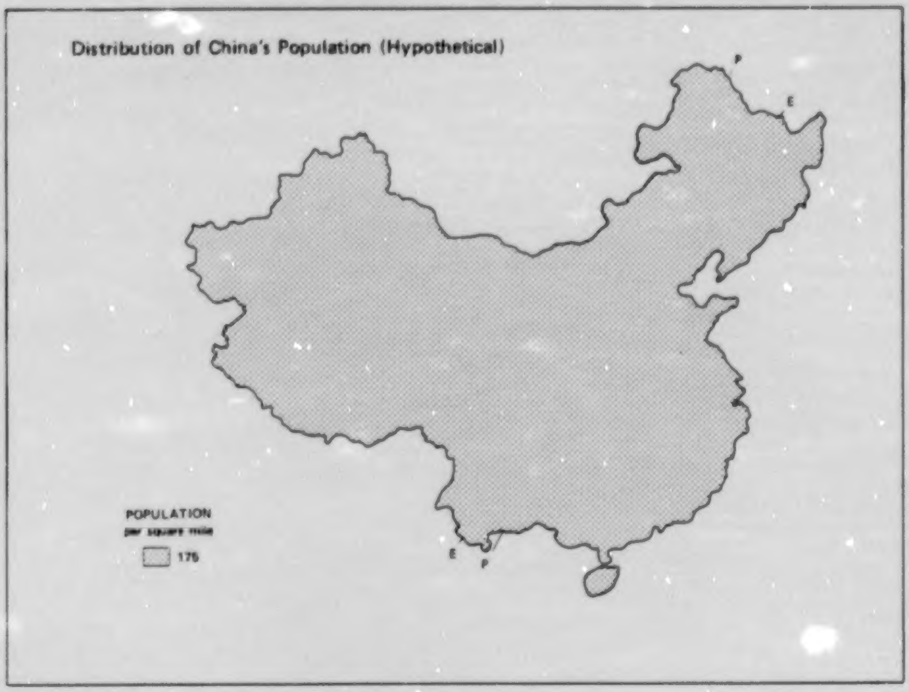
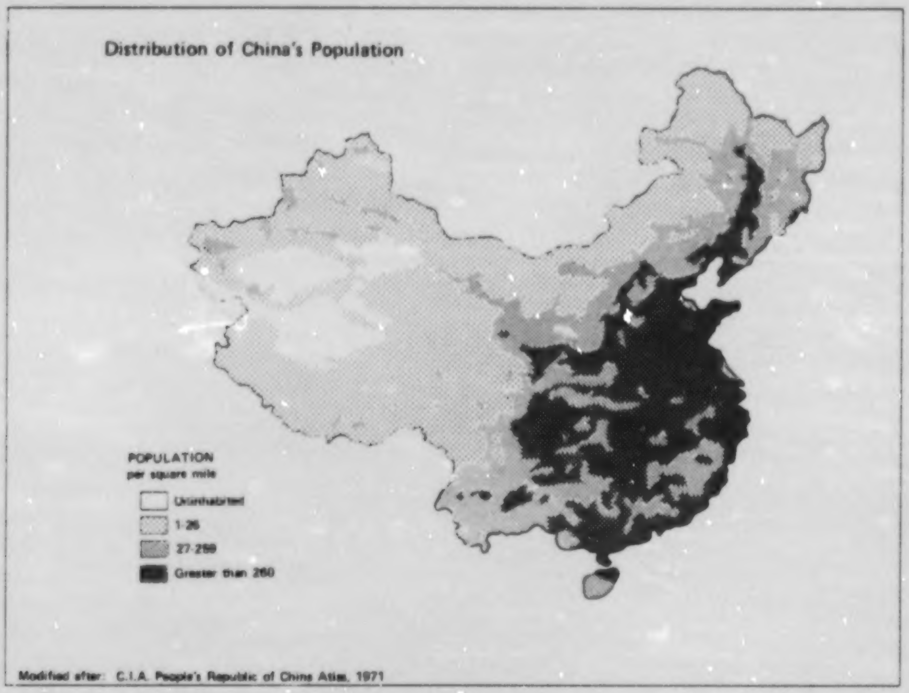


Figure 7.1

concentrated in the eastern half of the nation. (Show this by connecting the E's on Fig. 7.1.) Although there is some industrial activity to the west of this line, concentration is to the east. Where you find industries, you find population concentration; therefore the major population concentrations in China are expected east of the E-E line on the map.

Now let's consider climatic patterns as well as terrain. George B. Cressey, a great United States geography teacher, once informed his students that "too much of Asia is too cold, too dry, too mountainous, too infertile, or too remote to be attractive for the hungry millions in Asia."[11] This descriptive capsule is appropriate for much of China. (Show this by connecting line P to P.) The area west of this line fits into the too cold, too dry, too mountainous, too infertile, too remote description although not every descriptive term is applicable to all parts of the region. Considering the general physical nature of China west of the line (P-P), it must be concluded that the vast majority of the population is to the east.

Natural resource sites, oasis agriculture, and interior industrial developments have resulted in a small proportion of the population residing west of lines E-E and P-P. Also, several of China's ethnic groups have traditionally inhabited the western areas. Despite the evidence for assuming an absence of population from the western areas, there are substantial numbers of people living there. However, the number does not begin to approximate the population of eastern China. (Show Fig. 7.2.)



Modified after: C.I.A. People's Republic of China Atlas, 1971

Figure 7.2

> The heavy concentration of population in the east is evident. While the west has uninhabited areas, there are areas with considerable population. Regardless, the overwhelming concentration of population is in the east where industry is developed and agricultural activities are better suited. This is not to say that the east does not have mountains, or climatic problems, for it does, but the extremes of those conditions are not as pronounced in the east. The combination of more suitable agricultural land, early developments in manufacturing and commerce, and the center for the traditional Chinese culture have been of major significance in the development of China.

This activity represents one way of introducing the study of China in an expository manner. Several topics for later activities can be extracted from the introductory material. One logical sequence would be an in depth investigation of population, including cultural characteristics found in various subregions of China. Another sequence might focus on physical or economic attributes of China as they relate to population. Regardless of the subsequent topics, they can be anchored in this introductory population material.

Washington's Arid Lands: A Springboard Activity. The second springboard involves a case study of arid lands development and focuses on the interaction between man, technology, and environment in a dry climate. Factual information contained in tables is utilized extensively but the tables are not to be learned by the students; rather, they are used to generate evaluative information regarding the springboard statement. The tables contain evidence of a particular occurrence and their use in formulating explanation is modeled by the teacher. The submission of the data to inferential logic using a verbal mode moves the student through a data processing experience and students should be encouraged to apply the process of analysis to other arid environments.

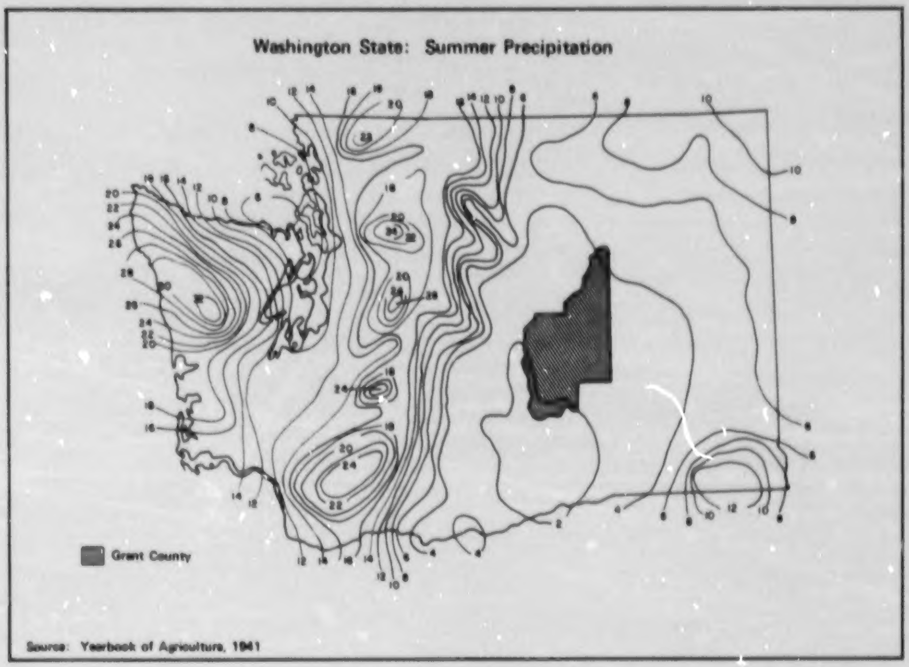
The data for Grant County provides an example of a dry area made productive. Whenever water becomes available in such areas, the population size and livelihood activities are subject to alteration. Those alterations can be suitable "springboards" to the study of numerous other human-physical environment interactions. The activity begins by showing students the statement in Figure 7.3 and having them discuss its validity. Then their attention is directed to the case study of Washington.[12]

HOT, DRY LANDS CANNOT SUPPORT

LARGE NUMBERS OF PEOPLE

Figure 7.3

The State of Washington is noticeably divided into relatively wet and dry areas. (Show Fig. 7.4.) The explanation for the rather precise division is the interception of moisture-bearing westerly winds by the Cascade Mountains which form a north-south barrier. To the west of the barrier is found abundant precipitation during the summer growing season. To the east, in the rain shadow of the mountains, growing season precipitation is inadequate for intensive agricultural activities without irrigation.


Washington State: Summer Precipitation

Source: Yearbook of Agriculture, 1941

Figure 7.4

The relationship between population and desert environment is evident in data describing an arid eastern Washington county in 1940. (Show Fig. 7.5.) Farms were large, averaging about 1,200 acres (only 600 farms in 735,134 acres), and livestock herding was prominent. Extensive land uses such as grazing were the general pattern for the county.

The data in Figure 7.5 suggests that several significant changes occurred in Grant County between 1940 and 1970. The population in 1970 is almost three times the 1940 level. The increase in population is accompanied by an increase in the total number of farms. As well as having more people, there are more farms, more acres in farms, but fewer sheep. The average size of farms in 1969, however, was about 690 acres in size (1,042,932 acres divided by 1,518 farms), indicating a conversion to more intensive types of land use. With more farms, more people, and fewer sheep, it can be hypothesized that Grant County was undergoing some type of agricultural revolution. The effects of that revolution enabled the supporting of a far greater population in the still arid country. Additional data are necessary to propose possible explanations for the changes. (Show Fig. 7.6.)

GRANT COUNTY, WASHINGTON

	1940	1970
Population	14,668	41,881
Number of Farms	600	1,518*
Acres in Farms	735,134	1,042,932*
Number of Sheep	36,375	11,735*

*1969

Figure 7.5

GRANT COUNTY, WASHINGTON

Total Acres	1939	1969
Croplands Harvested	133,386	359,213
Corn	34	19,543
Hay	10,951	74,941
Potatoes	444	27,708
Irrigated Land	8,036	241,201

Figure 7.6

The total cropland harvested in Grant County between 1939 and 1969 increased almost threefold. That increase, however, is overshadowed by the gigantic increases in acres devoted to corn, hay, and potatoes. Under what conditions can corn, hay, and potatoes grow in the desert? Why the dramatic increase? The explanation for the increase is implicit in the data for total irrigated acres. The introduction of irrigation to Grant County permitted agricultural activities which the natural arid climate did not. The county, therefore, is capable of supporting a larger population than expected based on climatic data.

The general explanation for the irrigated desert is that Grant County is within the Columbia Basin Bureau of Reclamation Irrigation Project. Waters are diverted from the Columbia River behind Grand Coulee Dam and carried in canals to irrigate the dry lands of Grant County and the surrounding area. Through the use of technical knowledge, man has converted a dry area of the earth into a green oasis. Similar projects have been carried out in the western United States and other parts of the world. Southern Idaho, eastern Colorado, southern California, Arizona, and Texas are only a few of such places in the United States. The Nile Valley of Egypt, the southern USSR, and South Africa are other places where dry environments have been manipulated to support relatively large populations.

The Advance Organizer as an Expository Technique

Jean Piaget, the eminent Swiss genetic epistemologist, has demonstrated through forty years of basic research that there are distinct stages in the development of children's thinking.[13] Elementary school children, ages seven to eleven, are primarily in the stage of concrete operations which means, according to Piaget, that they can conceptualize but their conceptualization always begins with some real, tangible system of objects or relations.[14] Advance organizers are one means of facilitating conceptualization for the elementary learner in the concrete operations stage.

An advance organizer establishes a cognitive conceptual framework into which the learner can integrate unfamiliar material. The function of the organizer is to "bridge the gap between what the learner already knows and what he needs to know before he can . . . learn the task at hand." Ausubel further asserts that the organizer has a higher level of "abstraction, generality, and inclusiveness of" material. Its relationship to the content is based upon its "suitability for explaining, integrating, and interrelating the material."[15]

Although they can be presented visually as diagrammatic models or orally as introductory statements, advance organizers are usually presented in written form. In that case, an advance organizer consists of "written material that serves the function of facilitating the incorporation and retention of subject matter. The organizer provides a brief summary of the more detailed material contained in the learning passage."[16] The purpose of the organizer is to relate abstract textual or verbal material to the learner's cognitive structure so that it will be more meaningful and, therefore, more easily internalized.

The written organizers presented below have the following characteristics:

1. They present in narrative expository passages selected key concepts which can be explained in more detail either in written format or in classroom discussion.
2. They define key concepts in simple rather than complex language.
3. They provide a narrative condensation of the major ideas which can be presented in more detail in subsequent instruction.

4. They are preorganizers because they are employed before the basic learning passage or classroom instruction.[17]

Japan's Growing Population and Growing Industries: An Advance Organizer. This organizer presents a simple, inclusive, abstract overview of several specific topics related to Japan—population and population density, manufacturing, and the importance of imports and exports to the Japanese economy. In the student text the organizer is then expanded into an entire chapter which includes detailed analyses of the basic concepts and principles mentioned in the organizer.

> The islands of Japan stay the same size. The number of people who live in Japan keeps getting larger. As the population gets larger, Japan becomes more crowded. Japan is very densely populated. As the population continues to grow, more food is needed. More people mean more goods and services are needed.
>
> The factories are producing more goods than ever before. New factories are being built. The factories in Japan need raw materials to keep working. Factories change raw materials into something more useful. Changing raw materials to more useful things is called manufacturing. Japan does not have many raw materials.
>
> To help meet the needs of a growing population and growing industries, Japan trades with other nations. To import means to buy from other countries. To export means to sell to other countries. Japan's main imports are food and raw materials. Japan's main exports are the things that are made in its factories.
>
> Japan imports raw materials. The raw materials are manufactured into more useful things. Some of the manufactured goods are then exported to other countries.[18]

The "Kenya's Railroad and Modernization" Organizer. The textual material following this organizer will detail how the building of the Kenya-Uganda railroad triggered rapid acculturation in the area. The maps and textual material together explain how the traditional caravan towns lost their functions as trade centers and were replaced by railway centers. Unlike the organizer which is written in the learner's familiar vocabulary, the textual material expands familiar concepts such as acculturation, urbanizations, and modernizations, and introduces some completely new terms—caravan trade center, railway trade center, highlands, political control, and cultural dominance.

> The modernization of Kenya began with the building of the railroad. The railroad opened up the southern part of Kenya to trade and settlement. It changed the locations of cities and brought urban growth and industrialization. It also helped the British begin the political development of the country.
>
> As the railroad was built, white settlers moved in. Fighting took place, and some of the tribal lands were taken from Africans. Transportation by railroads made it possible for many changes to come to Kenya.[19]

Thus advance organizers introduce new, unfamiliar ideas to learners in their familiar terms. The organizer makes the subsequent assimilation and accommodation of the more detailed, specific content meaningful and, therefore, more easily learned. The organizer facilitates the difficult mental process of going from the inclusive, abstract level to the specific, concrete level.

Summary and Conclusion

This paper began by asserting that much classroom instruction continues to consist of a transmission from a "sender" such as a teacher, book, or film to the "receiver," i.e., the learner. This teaching strategy was designated the expository strategy, which was then contrasted with the inquiry strategy. The nature of meaningful learning was discussed and two geographic themes—scale and spatial interaction—were presented as examples of anchoring ideas. Finally, geographic examples of "springboards" and "advance organizers" were provided.

Several pedagogic questions concerning expository teaching remain to be raised, but perhaps not resolved. For instance, are expository teaching strategies active or passive? A common criticism of expository teaching is that the learner is merely a passive receiver of an externally originated message. Because the learner is not physically involved in the material, critics would argue that the student is passive.[20] This is a weak criticism because if the content is presented within a meaningful framework, the learner will assimilate and accommodate the message. That process requires a high level of mental involvement; hence, the learner is clearly not passive but very active.

A second question is the difficult but crucial problem of whether expository instructional strategies facilitate retention and transfer, or the ability to apply cognitive skills and knowledge to a situation that differs from the conditions in which the learning originally occurred. We believe teachers who stress general concepts, principles, and generalizations rather than information encourage retention and transfer of significant learning. We also believe that geography has special transfer value resulting from its close relationships with the social and physical environments, relationships which the student may validate through daily experience.

NOTES

1. For discussions of this postulate from quite diverse points of view, see John Dewey, *My Pedagogic Creed*, Personal Growth Leaflet 19 (Washington, D.C.: National Education Association, 1917) and Marshall McLuhan, *Understanding Media: The Extensions of Man* (New York: McGraw-Hill, 1964).
2. See Edwin Fenton, *Inquiry in the Social Studies*, Social Studies Readings No. 2 (Washington, D.C.: National Council for the Social Studies, 1968); Bernice Goldmark, *Social Studies: A Method of Inquiry* (Belmont, Calif.: Wadsworth, 1968); and Hilda Taba, *Teacher's Handbook for Elementary Social Studies*, introductory ed. (Reading, Mass.: Addison-Wesley, 1967).
3. David Ausubel, *Educational Psychology: A Cognitive View* (New York: Holt, Rinehart and Winston, 1968), p. 24.
4. Cited in Benjamin S. Bloom, ed., *Taxonomy of Educational Objectives, Handbook I: Cognitive Domain* (New York: Langmans, Green and Co., 1956), p. 29.
5. R. Murray Thomas and Dale L. Brubaker, *Curricular Patterns in Elementary Social Studies* (Belmont, Calif.: Wadsworth, 1971).
6. Dorothy J. Skeel, *The Challenge of Teaching Social Studies in the Elementary School* (Pacific Palisades, Calif.: Goodyear, 1970).
7. Jean Piaget, *Judgement and Reasoning in the Child* (London: Kegan Paul, 1928); Jean Piaget and Anne-Marie Weil, "The Development in Children of the Idea of the Homeland and of Relation with Other Countries," *International Social Science Bull.*, vol. 3 (1951),

pp. 561-78; G. Jahoda, "The Development of Children's Ideas about Country and Nationality," *British Journal of Educational Psychology*, vol. 33 (1963), pp. 47-60; Joseph P. Stoltman, *Children's Conception of Territory: A Study of Piaget's Spatial Stages*, unpublished Doctoral Dissertation, University of Georgia, 1971; and David Rand and John O. Towler, "The Development of Concepts of Nationality and Spatial Relationships in Elementary School Age Children," presented at the National Council for Geographic Education Annual Convention, Milwaukee, Wis., 1972.

8. David Harvey, *Explanation in Geography* (London: Arnold, 1969); Peter Haggett, *Geography: A Modern Synthesis* (New York: Harper and Row, 1972); and Kirk H. Stone, A Geographic Strength: The Multiple-scale Approach," *Journal of Geography*, vol. 71, pp. 354-62.
9. Edward L. Ullman, "The Role of Transportation and the Bases for Interaction," in *Man's Role in Changing the Face of the Earth*, W. L. Thomas, ed. (Chicago: University of Chicago Press, 1956), pp. 862-80; and Douglas K. Fleming, "Spatial Interaction," in *Focus on Geography: Key Concepts and Teaching Strategies*, Phillip Bacon, ed., 40th Yearbook of the National Council for the Social Studies (Washington, D.C.: National Council for the Social Studies, 1970), pp. 147-72.
10. Sources for this activity were: *Population Trends in Eastern Europe, the U.S.S.R. and Mainland China* (New York: Milbank Memorial Fund, 1960), pp. 93-176; G. T. Trewartha, "New Maps of China's Population," *Geographical Review*, vol. 67 (April 1957), pp. 234-39; Ping-ti Ho, *Studies on the Population of China, 1368-1953* (Cambridge, Mass.: Harvard University Press, 1959); S. Chandrasekhar, *China's Population* (Hong Kong: Hong Kong University Press, 1959); and Central Intelligence Agency, *Communist China: Map Folio* (Washington, D.C.: Office of Basic and Geographic Intelligence, 1971).
11. Robert B. McNee, "Toward Stressing Structure in Geographic Instruction or Goodby to Hevea Braziliensis and All That," in *The Social Sciences and Geographic Education: A Reader*, John M. Ball et al., eds. (New York: John Wiley & Sons, 1971).
12. Sources for this activity were: U.S. Bureau of the Census, *Census of Agriculture, 1940;* U.S. Bureau of the Census, *Characteristics of the Population, 1940;* U.S. Bureau of the Census, *Census of Agriculture, 1969;* and U.S. Bureau of the Census, *Characteristics of the Population, 1970* (Washington, D.C.: Government Printing Office).
13. Jean Piaget, *Psychology of Intelligence* (Totowa, N.J.: Littlefield, Adams and Co., 1968); and Jean Piaget and Barbel Inhelder, *The Psychology of the Child* (New York: Basic Books, 1969).
14. Bruce Joyce and Marsha Weil, *Models of Teaching* (Englewood Cliffs, N.J.: Prentice-Hall, 1972).
15. Ausubel, *Educational Psychology*, pp. 148-49.
16. Marion J. Rice, Buckley R. Barnes, and Elmer U. Clawson, *The Effects of the Position of Organizers on the Learning of Structured Anthropology Materials in Grades Three and Six*, U.S. Department of Health, Education, and Welfare (Athens, Ga.: University of Georgia, College of Education, 1972).
17. The two following activities on Japan and Kenya were taken from ibid.
18. Ibid.
19. Ibid.
20. Physical activity should not be confused with learning. A student, for example, can be working diligently at cutting, pasting, and coloring a map, but this is not necessarily a worthwhile cognitive experience. It should be added that this experience may be exhilarating, but the activity cannot be justified on a cognitive basis.

8

Teaching Geography Through Value Strategies

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Values in Science, Society, and Education

Over a quarter century ago John Dewey wrote, "A skeptically inclined person viewing the present state of the discussion of valuing and values might find reason for concluding that a great ado is being made about very little, possibly about nothing at all."[1] Aimed at the philosophical and scientific debates of the late 1930s, that remark might be directed equally well at much of the contemporary literature in the social sciences as well as social studies education. His skepticism notwithstanding, Dewey went on to argue that all deliberate and planned activities, including science, citizenship, and education are guided by values and that consequently, the study of values intersects with all significant human concerns.[2]

Value considerations always have been an important dimension of scientific inquiry.[3] Scientists gather and apply data to some purpose, and values function as the directing mechanism in the process. While the factual dimension of scientific questions, problems, or investigations are contrasted with their valuative properties, suggesting that facts and values somehow may be segregated in the scientist's thinking as well as in his work, this dualism is basically false insofar as it purports to accurately describe the process of scientific analysis. In any inquiry or analysis, the most fundamental statement of fact reflects some judgment of its value. "Any conclusion as to what the facts are in a given case," as Kaplan observes, "is the outcome of a process in which certain valuations also play an essential role."[4]

For most citizens, value-related questions are an especially intriguing and vital part of life. Is a new recreation area needed and where should it be located? Should the new expressway cut through the northern or the center part of the city? Shall low-cost housing be constructed in their community? Why is so much money spent on defense? Should we build more roads or increase mass transportation? In attempting to answer

The material is adapted from chapters in the author's books, *Elementary Social Studies As a Learning System* and *Social Studies Strategies: Theory into Practice* (New York: Harper & Row, 1976).

these questions the citizen is prepared to tolerate and assimilate a barrage of facts if they can be related to what he believes to be important to a resolution of the issue. Not surprisingly, he wearies quickly of information that he feels only describes and explains. What he desires are answers to his questions and solutions to his problems. Acquiring information is merely one step, albeit an important one, in making his choices and decisions. An additional, necessary, and crucial step is the integration of that information with a decision-making strategy that consciously considers personal and social values.

The current state of the dialogue on values in education might be described as yeasty, if not confusing.[5] The term "value" itself, for example, seems to mean different things to different people. Frequently, "value" is used interchangeably with "affect" to connote an emphasis upon personal feelings about a problem or issue. This meaning covers a particularly wide spectrum of curricular and instructional practices.[6] Sometimes "value" refers to a basic commitment to the fundamental worth of a certain idea such as honesty, human dignity, or ecological stability. Raths and his colleagues have summarized the definitional problem succinctly:

> The meaning of the term "value" is by no means clear in the social sciences or in philosophy. . . . One can find consensus for no definition. About the only agreement that emerges is that a value represents something important in human existence. Perhaps because it is such a pivotal term, each school of thought invests it with its own definition. For the same reason, a particular definition is often not acceptable elsewhere.[7]

A further source of confusion arises from the fact that seldom are distinctions made between a "value" and other dimensions of affect such as "beliefs," "attitudes," or just general statements of feeling.[8] Clearly, individuals have varying types and degrees of affective responses to experiences, problems, and decisions, but the instructional implications of these differences are seldom stated. Modifying students' attitudes toward cities, for example, is a different instructional task than getting them to take a stand on the issue of whether urban and suburban school districts should be merged. As most tourist bureaus have recognized, positive *attitudes* may be created through certain promotional strategies without any necessary effect on people's more basic *values*.

A third quarrelsome problem stems from diverse approaches to how value questions should be treated in the classroom. Some geographic educators emphasize the encouragement, fostering, and even inculcation of specific value orientations. Others would focus on having students identify, clarify, and analyze their own values, and would disclaim responsibility for having students arrive at any one set of "correct" values. Still another group of value educators stresses the discussion and resolution of value priorities, conflicts, and discrepancies, and advocates a comparative/analytic approach to values in the classroom.

However conceived, values teaching has always been an important concern of the schools. Historically, this concern often has been expressed through an emphasis on "good citizenship" and "desirable socio-civic behavior." While the meanings of these terms were often the subject of considerable debate, the dominant interpretation emphasized the support and promotion of existing norms of behavior. The implication was that learning to be a good citizen involved being inculcated in the dominant social, economic, and political views of the society. This perspective on values education created serious problems in those schools where pluralistic value systems were the norm or in those schools where a subculture held values at odds with those of the dominant culture, e.g., Amish and native American schools. In addition, the increasing resistance of minority groups to the norms and mores advocated by majorities, the growing influence of the social sciences on the curriculum and the rise of the inquiry movement all have contributed to a reaction against efforts to inculcate values in schools. Perhaps the most serious challenge to the validity of the values inculcation position is the charge that it provides no direction for action in situations involving conflicts between cherished value. Learning loyalty and honesty as desirable absolute values gave no clue as to how to behave in situations where it is impossible to hold both values simultaneously. A presidential assistant, for example, who discovers that his employer has committed some transgression is torn between what his value of honesty may compel him to reveal and what his value of loyalty may compel him to suppress. Both are desirable values, but in the case cited some stratagem beyond mere value maintenance is required for decision making.

If "geographers are getting into all the things that are happening," as Julian Wolpert has suggested, then they must accept responsibility for helping citizens link values and geographic knowledge in a manner that addresses important human concerns. It follows that geographic educators must assume responsibility for developing curricular and instructional strategies that will integrate values and knowledge and thus help students learn to make appropriate choices and decisions.

Value Strategies for Geographic Education

To assist the reader over some of the semantic and philosophical hurdles that are present in discussions of value strategies, three general characteristics shared by all the approaches to values education considered in this chapter have been summarized. Values are involved when:

1. The focus is on an issue or problem that requires a student's preference.
2. Some personal statement of action or decision making on the part of the student is necessary to complete the instructional process.
3. Some measure of personal introspection is required to arrive at a decision.

While these commonalities of value strategies may suggest a dominant affective dimension, it should be stressed that cognitive elements have a coordinate role. Thinking and feeling meld in every act of forming and employing values, and it is the interaction of thinking and feeling that propels the formation and employment of values.[9] The terms *cognitive* and *affective* are useful categories for planning curriculum *objectives*, but they should not be considered as mutually exclusive types of learning outcomes.[10]

What instructional strategies are available to teachers who realize the necessity and desirability of involving students with value-related issues but who wish to do so in an open and reflective fashion? Four alternative approaches are identified that seem to meet these criteria:[11]

1. The values clarification strategy developed by Louis Raths and his associates.
2. The value survey strategy drawn from the research of Milton Rokeach and his associates.
3. The value analysis strategy developed by authors of *Values Education*, the 1971 Yearbook of the National Council for the Social Studies.
4. The moral reasoning strategy originating in moral development theory as advanced by Lawrence Kohlberg and his associates.

While some general similarities exist among these approaches, they vary considerably in both form and substance. As a case in point, Kohlberg's work does not deal with values per se, but with the larger areas of what he describes as "moral development" into which values enter. As his theoretical and research work is applied to classroom practice, however, the resulting strategies resemble what most teachers might identify as "value-related;" hence, his unique work is included. We now turn to examples of how each of these strategies can be used to accomplish various objectives of geographic education.

The Values Clarification Strategy

The broad sweep of the values clarification approach used by Raths and his associates is detailed in their book *Values and Teaching*.[12] In essence, their position is that values are based upon three processes: *choosing, prizing* and *acting*. These three processes are translated into seven criteria that *must* be present in order for a value to result:[13]

Choosing:
1. An item must be freely chosen.
2. Alternative choices must be available.
3. Thoughtful consideration of the consequences of alternatives must precede a choice.

Prizing:
4. We must be happy with and cherish our choice.
5. We must be willing to publicly affirm our choice.

Acting:
6. We must act on our choice.
7. The choice is repeated in some pattern of our life.

"These processes," according to Raths and his colleagues "collectively define valuing. Results of the valuing process are called values."[14]

To employ this strategy, a teacher would assist students in moving through the seven steps by employing devices such as the *Value Sheet*. A Value Sheet "in its simplest form consists of a provocative statement and a series of questions duplicated on a sheet of paper and distributed to class members."[15] The authors recommend that students first examine and complete these sheets privately, and then share their results in discussion with the teacher or other students. Value Sheets may take many forms and incorporate a variety of different questioning sequences, but their basic characteristics are an open-ended episode or case that calls for value-related decisions and a series of questions that cover the seven steps of the value-clarification process.[10] In turn, Value Sheets are just one of the ways in which value-clarification strategies may be constructed, although they are probably the most immediately useful application for the geographic educator; other value-clarification strategies are presented in *Values and Teaching*.

Dublinville's School Problem: Where Will the Kids Go? Figure 8.1 and Figure 8.2 constitute a Value Sheet based on an actual incident.[11] They involve a small number of spatial variables—population distribution, transportation, location, boundaries—and engages students in the process of making a difficult decision. Copies of Figures 8.1 and 8.2 would be distributed to each student. They would read the problem, answer the questions individually and share their answers with the class. As they grapple with the problem, the students will find themselves choosing, prizing, and acting, i.e., engaging in the value-clarification process outlined by Raths et al.

Dublinville's School Problem—Where Will the Kids Go?

Dublinville Township has four elementary Schools: Farley Glen, Jamesville, Fort Williams, and Sand Town. These are shown in the map. Students living within the dotted line shown on the map go to the school that is in their area. This plan for school attendance has worked fairly well in the past.

But this year, there is a problem in the Jamesville school area. There are now 28 classes of students in the area, but Jamesville has only 26 classrooms. There is no time to build new classrooms at Jamesville. Where will the kids go to school?

Fort Williams School does not have any extra space. Sand Town and Farley Glen schools *do* have extra space and could take the students from Jamesville. But the parents in Jamesville area do not want their children sent all the way to Farley Glen or Sand Town.

It might be possible to increase the number of students in each classroom at Jamesville. Nobody though seems to like that idea. It also might be possible to change the boundary of each school area. Doing this would mean that some students who had gone to one school for several years would now have to go to a new one. Changing school boundaries is a lot of work, and they might have to be changed again next year if one area gets more children. Some parents and the school board are *not* in favor of changing the size and location of the school areas.

"I'm just not sure what we are going to do with the two extra classes of students," the school board president said.

Questions

1. If you were the school board president, what would you do to handle the classroom shortage?

Figure 8.1. Dublinville's school problem.

2. What do you think will happen if the plan you suggest is put into action?
3. What are the advantages and disadvantages of the position you have taken?
4. Why did you reject the other ways of handling the classroom problem?
5. Suppose you were to appear before the school board to present your solution to the problem. Write out a short statement of exactly what you would tell the board.
6. Suppose you are a student living in the Jamesville area and a member of one of the "extra" classes. What could you do to get the school board to accept your suggestion?
7. The classroom-shortage problem may happen again in the school district. What policy or plan do you think the board should set up to handle any future problems of this type?

Figure 8.1. Continued.

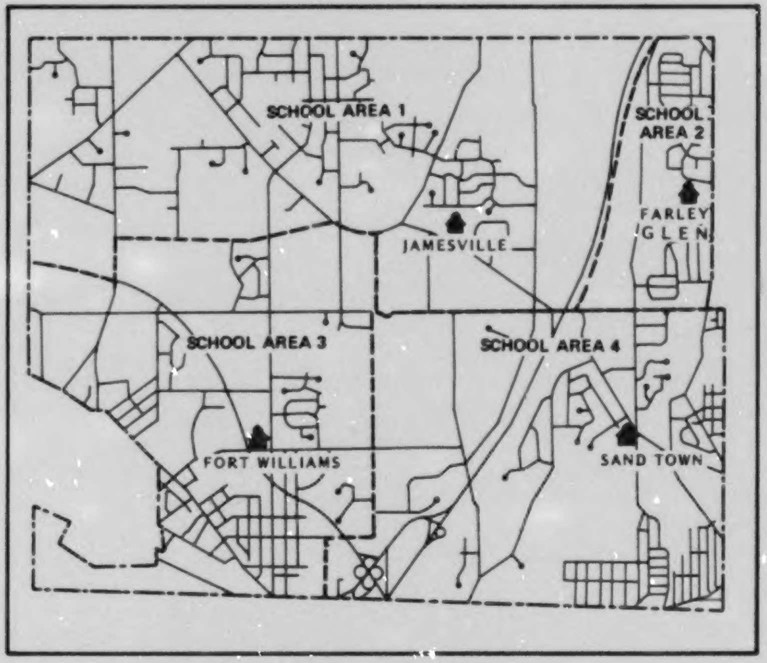
SCHOOL AREA 1
SCHOOL AREA 2
FARLEY GLEN
JAMESVILLE
SCHOOL AREA 3
SCHOOL AREA 4
FORT WILLIAMS
SAND TOWN

Figure 8.2. Dublinville school districts.

The Value Survey Strategy

The research efforts of Milton Rokeach and his associates have produced a number of findings concerning beliefs, attitudes, and values.[18] The instruments used in their research as well as their conclusions suggest some useful instructional approaches to values in geographic education. Since beliefs, attitudes, and values are interrelated in Rokeach's schema, it may be useful to define and differentiate each of the terms. "A belief," Rokeach offers, "is any simple proposition, conscious or unconscious, inferred from what a person says or does, capable of being preceded by the phrase 'I believe that . . .' "[19] All beliefs, according to Rokeach, have thinking, feeling, and potential action components, i.e., cognitive, affective, and behavioral components.

An attitude is a cluster of interrelated beliefs directed toward a common object that helps control our responses.[20] One may have, for example, a set of related beliefs that form attitudes toward regional planning, population control, the Sierra Club, and so forth.

Rokeach considers a value to be a special class of belief. "I consider a value to be a type of belief, centrally located within one's total belief system, about how one ought or ought not to behave, or about some end-state of existence worth or not worth attaining."[21] Values are few in number, according to Rokeach: "An adult probably has tens of hundreds of beliefs, thousands of attitudes, but only dozens of values."[22] This relatively small collection of values is organized hierarchically for each individual into a value system. A change in the relative status of a single value in the hierarchy consequently will affect the status of other values.

Rokeach has devised a Value Survey which assesses an individual's value system.[23] It consists of two sets of 18 values; one set is designated as instrumental, or mode of conduct values, the other as terminal, or end-state values. Sample instrumental values are ambitious, independent, honest, polite, broadminded, clean, and helpful. Terminal values consist of goals such as a comfortable life, social recognition, national security, freedom, equality, family security, and a world at peace. In Rokeach's survey, respondents are given some explanation for each of the terms and then are asked to rank them in order of perceived importance. Criteria for choices are to be personal and each individual establishes his own list of priorities.

Through the raising of one's value system to the level of consciousness, one generally can learn a great deal about himself. Correspondingly, through the sharing of results and rationale for choices with others, reciprocal insights result. Rokeach and his associates also have some evidence that respondents tend to modify their value systems when they are alerted to inconsistencies in their own value systems or in the value systems of others:

> The findings suggest that a person may undergo long-term value and behavioral change by merely being exposed to information about value-attitude relationship and inconsistencies as they have been found to exist in others, even if similar information about oneself is not made available. Such information about others can easily be presented in many contexts by lectures to many different types of student and adult audiences, by textbook assignments, by face-to-face communication and through mass media.[24]

Building a New City. Figure 8.3 illustrates the application of the Value Survey ap-

Building a New City

A number of new cities are being planned for the United States. Many of our cities just grew without anyone really planning them. In the new cities, most things will be carefully planned: where people will live, where they will shop, work, go to school, and have fun. One new city being planned will be called Jonathon. How do you think Jonathon should be planned?

Below are some things that planners of Jonathon will have to think about. Put a *1* in front of the thing you feel is the most important for the planners to think about. Put a *2* in front of the second most important thing, and so on until you have numbered everything from 1 to 7.

______ People should be free to buy a house any place they like.
______ There should be plenty of churches and temples built.
______ There should be enough schools and colleges so that everyone can learn.
______ A police department should be set up.
______ People should have things to do that they really like.
______ All people should be treated equally.
______ There should be jobs for everyone who wants them.

Figure 8.3. Modified value survey.

proach to urban planning by young children. The cluster of abstract values to be used is taken from Rokeach's set of terminal values: freedom, salvation, wisdom, national security, a comfortable life, equality, family security. Copies of Figure 8.3 would be distributed to each member of the class, read aloud, and explained. Each child would complete the task individually. Each of the seven statements is an attempt to reflect, at a child's level, the corresponding values of freedom, salvation, wisdom, national security, a comfortable life, equality, and family security. One third grader, for example, completed her activity sheet and rank ordered the values in a way suggesting a community that reflects the priorities of family security, wisdom, national security, and equality:

6 People should be free to buy a house any place they like.
5 There should be plenty of churches and temples built.
2 There should be enough schools and colleges so that everyone can learn.
3 A police department should be set up.
7 People should have things to do that they really like.

__4__ All people should be treated equally.
__1__ There should be jobs for everyone who wants them.

After the children have completed the activity sheet, they are asked to share their rankings with each other and present the rationale for such choices. The children should be allowed to offer alternatives and to raise questions about each other's rationale. When this phase of the discussion has been completed, the students' attention can be directed toward the actual planning considerations that would be necessary to construct a community which reflects the value priorities of individuals or of the class. A class profile may be obtained by averaging the rankings of the entire class for each of the seven statements.

To apply the value priorities to spatial dimensions, the teacher may ask the class to consider their local city or community. A map of the area will help them visualize locations and distributions. They might consider the distribution of schools and colleges, of employment opportunities, of churches, of parks, and so forth, comparing these with the distribution of population in the community or city, perhaps distinguishing socioeconomic groupings. Questions could then be raised about equality of employment opportunity, access to schools and colleges, access to churches, and so on. If there are restrictions by realtors regarding home purchases by minorities in parts of the city, this could be discussed.

The class might then be asked how the distributions of the above facilities might have been arranged to better reflect the value priorities of the class in their town. Or they may consider planning a new town which would ideally reflect the value priorities they have ranked as a class, or as individuals. Each student might work from an individual map or a class map might be used based on the class value profile. As much geographical data as are relevant and appropriate for the class involved can be introduced. If time and interest permit, communities that reflected alternative value systems could be constructed and compared and contrasted.

An alternative way of using a Value Survey strategy would be to begin with some basic data concerning a community, and then attempt to infer the value priorities reflected in its spatial organization and environmental characteristics. The case of Columbia, Maryland, a planned community, provides an excellent illustration. The strategy would begin with a reading of the *Columbia Plan* (Fig. 8.4) and an examination of the map of Wilde Lake Village (Fig. 8.5).[25] Discussion then would proceed from comparisons of individual student inferences concerning the value structure implicit in Columbia's plan to a discussion of the student's feelings about such priorities. A follow-up stage might involve their own priorities as a basis for planning or for making modifications in the Columbia design by examining the map (Fig. 8.5) and considering possible changes at each step, the students would discuss social implications of their own as well as Columbia's plans.

The Value Analysis Strategy

The 1971 Yearbook of the National Council for the Social Studies, edited by Lawrence Metcalf, took as its theme, "values education."[26] In it, the authors developed a systematic strategy for arriving at what they refer to as "value

Columbia Plan

The Columbia Plan starts with a neighborhood of 800 to 1,200 families. Near the center of each neighborhood will be an elementary school, park and playground, swimming pool, small community building and, usually, a convenience store.

From two to four neighborhoods make up a village of from 10,000 to 15,000 people. Each village center provides the kinds of shopping and services a family needs frequently, like a bank, supermarket, pharmacy, barber shop, beauty salon, cleaners, and professional offices. Most village centers will have middle and high schools, along with village-wide religious and recreational facilities.

Columbia is planned to have seven villages surrounding a downtown core.

Columbia's downtown is just beginning to grow. It starts with Kittamaqundi, a 32 acre lake, and extends westward.

Along the lake today are the Exhibit Center, four office buildings and Cross Keys Inn at Columbia with 150 rooms, a restaurant, and lounge.

Across Little Patuxent Parkway is The Mall in Columbia. The Mall is the commercial heart of Columbia's downtown, featuring in its first phase Woodward & Lothrop and Hochschild, Kohn department stores, plus 102 specialty shops and services.

Westward on Little Patuxent Parkway, the new city's major interior arterial road, is Symphony Woods, the 40 acre permanent downtown park. The Merriweather Post Pavilion of Music, which can accommodate as many as 10,000 people is located there. Nearby is the Garland Dinner Theatre.

Continuing west on the parkway are Columbia's first fire station, an auto care center, the first of several major office buildings, a garden shop, a home improvement store, and a general rental store. Howard Community College has its first building completed, and nearby, the Columbia Hospital for subscribers to the Columbia Medical Plan, is under construction.

Along with residential and downtown areas, the Columbia plan designates more than 20 percent of the acreage for permanent open spaces, including woods, streams, parks, lakes, golf courses, pathways, and school playgrounds interwoven throughout the city.

Another 20 percent of the land is set aside for the business and industry necessary for the growth and balance of the new city and its institutions.

Figure 8.4. Columbia plan. (*Visitor's Guide to Columbia* Columbia, Md.: Howard Research and Development Corp., 1971, p. 6.)

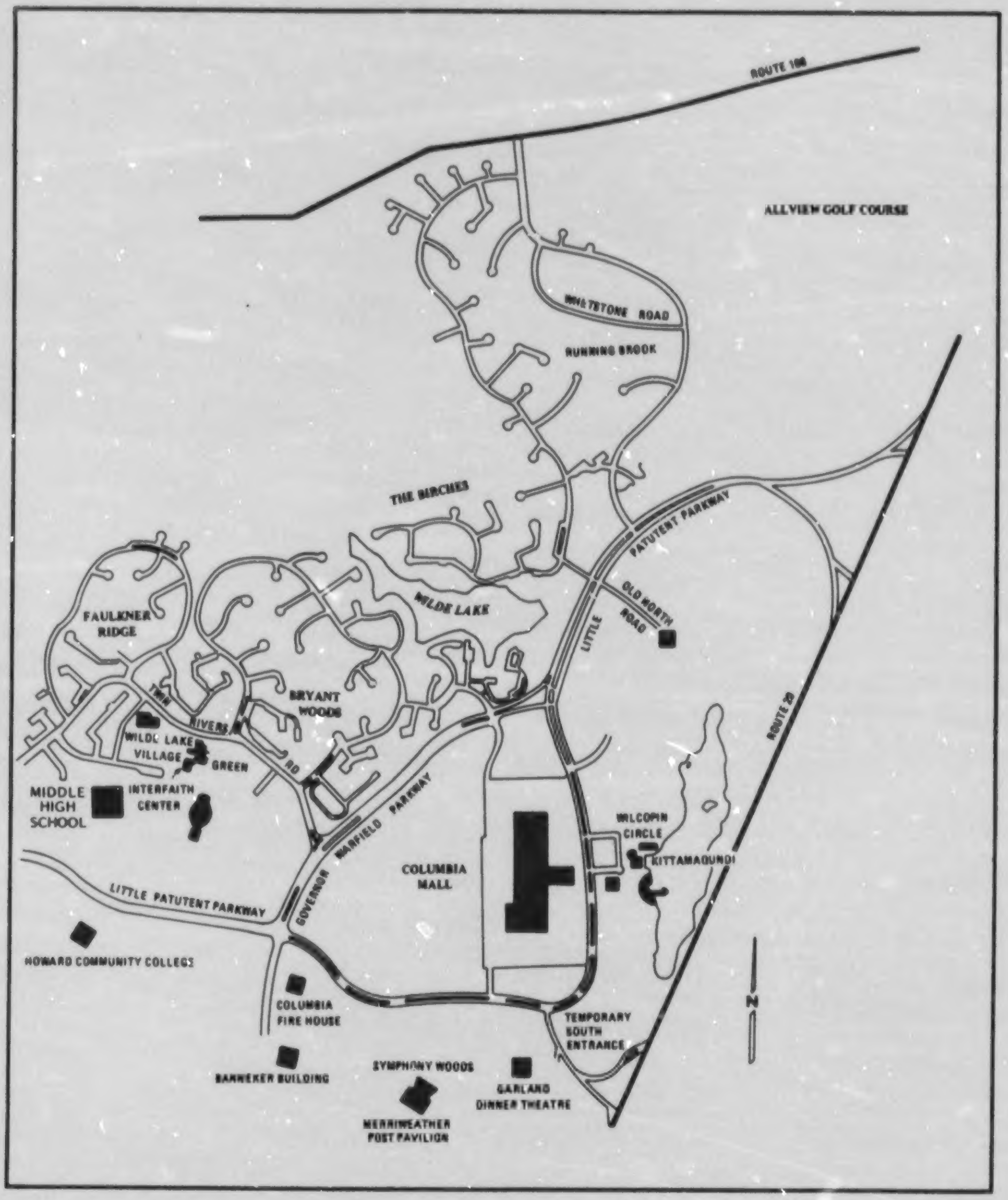
ROUTE 108
ALLVIEW GOLF COURSE
WILTSTONE ROAD
RUNNING BROOK
THE BIRCHES
PATUTENT PARKWAY
OLD NORTH ROAD
LITTLE
WILDE LAKE
FAULKNER RIDGE
TWIN RIVERS RD
BRYANT WOODS
WILDE LAKE VILLAGE GREEN
MIDDLE HIGH SCHOOL
INTERFAITH CENTER
ROUTE 29
WILCOPIN CIRCLE
KITTAMAQUNDI
GOVERNOR WARFIELD PARKWAY
COLUMBIA MALL
LITTLE PATUTENT PARKWAY
HOWARD COMMUNITY COLLEGE
COLUMBIA FIRE HOUSE
TEMPORARY SOUTH ENTRANCE
N
BANNEKER BUILDING
SYMPHONY WOODS
GARLAND DINNER THEATRE
MERRIWEATHER POST PAVILION

Figure 8.5. Village of Wilde Lake, Columbia, Maryland.

judgments." "Value judgments may be defined roughly as those judgments which rate things with respect to their worth."[27] In a chapter by Chadwick and Meux, a strategy labeled the Rudimentary Procedure for value analysis is described in some detail. It consists of eight steps:[28]

Step 1. Selection of Problem Topic
Step 2. Provision of Adequate Source Materials
Step 3. Provision of Proper Atmosphere
Step 4. Individual Listing and Ranking of Positive and Negative Statements about the Topic
Step 5. Class Listing, Ranking, and Discussion of Positive and Negative Statements
Step 6. Formulation of Possible Solutions for Highly Negative Statements
Step 7. Questioning Informed Sources
Step 8. Making Observations and Recommendations

While the Yearbook authors do not specify the grade level at which their approach may be applied, it seems most appropriate for the secondary level. Accordingly, the Rudimentary Procedure for value analysis will be illustrated with an issue that might be tackled by high school students.

Ms. Horowitz's class is using the value analysis approach to analyze the hotly debated issue of how wilderness areas shall be managed and used. The discussion initially arose when Ms. Horowitz called to the class's attention a recent article in the local paper announcing that the use of automobiles within Yosemite National Park henceforth would be banned. Most students generally applauded this new policy as a regrettable but necessary restriction that would reduce pollution and congestion and preserve the natural beauty of the park. Some students said they simply didn't understand all the fuss; others asked about why this particular park was instituting such a policy. A cohesive minority of the class, however, directly challenged the thesis that the park had a right to limit accessibility in order to preserve natural areas. They pointed out that the national parks and forests were there to serve all the people, and the only fair maintenance policy would be one that represented the wishes of the majority of Americans. They believed most Americans liked driving and disliked walking; besides, they argued, only a small percentage of the population had the physical stamina, training, or inclination to explore wilderness areas.

The issue as it evolved by the end of the class session clearly went beyond the specific Yosemite policy to the larger national issue of how should the rapidly vanishing wilderness areas be managed. It was equally clear that almost everyone in the class had little solid information to support any position. No consensus could be reached even on what the existing national policy was. Only two students in the class had firsthand experiences with any national park or forest, much less a wilderness area. As the class ended, Ms. Horowitz requested and received suggestions for possible sources of information concerning the issue. She closed by noting that she would report back to the class as soon as she could assess the availability of suitable resource material.

The next day Ms. Horowitz distributed copies of a map showing the wilderness areas in the United States. The students became intensively involved in a discussion of the location, amount, and even definition of wilderness. Eventually, Ms. Horowitz believed they were ready to begin their library research into the wilderness area issue. As the students uncovered relevant data, they constructed individual folders containing lists of positive and negative statements about wilderness areas and ranked them in order of perceived importance.

Tom completed his folder as shown in Figure 8.6. Notice that Tom's list is uneven

Tom's Statement about the
Preservation of Wilderness Areas

Positive Statements	Negative Statements
1. Gives those who want to make the effort a real special nature experience	1. Closes off scenic beauty from a majority of people
2. Guarantees open spaces for future generations	2. Makes it tough or impossible for disabled people to see the special nature areas
3. Protects and preserves wildlife	3. Impedes progress (e.g., electricity producing dams)
4. Preserves purity of water—an important natural resource	4. Discourages development of natural resources
5. Provides a place for different kinds of outdoor activities	5. Prevents needed management of environment to counter effects of civilization
6. Keeps areas in an unspoiled natural state	6. Takes up land that could be used for more important things
7. Helps keep the ecological balance from being upset	7. Based on unrealistic view of nature—man is an intruder
8. Lets scientists have a kind of laboratory to study nature	8. Gives in to conservation pressure-group demands
9. Maintains the public trust given to the national park and the national forest service	9. Reduces number of recreational management jobs
10. Provides a cheap recreation area	10. Reduces sale of nonwilderness recreational equipment
11. Helps sale of wilderness recreational equipment	

Figure 8.6. Tom's statement about the preservation of wilderness areas.

and not all of the statements are clear to a reader. One function of the discussion phase which follows the preparation of the folders is clarifying the meaning of statements, as well as assessing their relative importance. When this phase concluded, a class list of positive and negative statements related to the topic had emerged.

Next Ms. Horowitz's class focused on the negative statements that have received the highest ratings:

1. Closes off scenic beauty from a majority of the people
2. Makes it difficult for disabled people to see the special natural areas
3. Discourages development of natural resources

Each student now constructs possible solutions for the major negative statements. Tom's solutions are:

Solution 1: Diversify recreational areas
Solution 2: Increase environmental education
Solution 3: Seek other sources of resources

The next step for Tom is to construct a second folder. (See Fig. 8.7.) In it, each of his solutions is ranked in order of perceived importance, and below each of them is a list of positive and negative statements, also ranked in order of importance.

Following the construction of their solution folders, the class quizzed Ms. Horowitz on points of information and conducted some further research on items with which she was not familiar. When they had acquired all the necessary information, they wrote out and submitted their observations and recommendations. Tom's list is shown in Figure 8.8.

The Moral Reasoning Strategy

Over the past twenty years, Lawrence Kohlberg and his associates have developed, refined, and tested a theory of moral development based upon Piaget's notions of hierarchical stages. The Kohlberg research conducted on children in this and other countries revealed six stages of moral reasoning through which all individuals move.[19]

Stage 1. *Orientation to Punishment and Obedience.* The physical consequences of an action determine whether it is good or bad.

Stage 2. *The Instrumental Relatival Orientation.* Right action consists of that which instrumentally satisfies one's own needs and occasionally the needs of others.

Stage 3. *Good Boy-Nice Girl Orientation.* Seeking approval of others; seeks to gain approval or avoid disapproval. Conforms to stereotypes of majority or natural role behavior.

Stage 4. *Law and Order Orientation.* Adherence to established rules for their own sake. "Doing one's duty" and evidencing respect for authority constitute right behavior.

Stage 5. *Contractual Legalistic Orientation.* Recognition of an arbitrary element in rules for the sake of agreement. Duty is defined in terms of contract and respecting the rights of others and the will of the majority. Right tends to be determined in terms of what has been agreed upon by the whole society or more general principles such as "the greatest good for the greatest number."

Tom's Solutions to Wilderness Area Problems

Solution 1: Diversify Recreation Areas

Positive Statements	Negative Statements
1. Protects rights of both majority and minority	1. Some of the most scenic nature areas will still be cut off from majority
2. Provides balance between different kinds of recreation areas	2. Not all areas are large enough for diversification
3. May encourage more appreciation of nature	3. Management of diversified areas is difficult

Solution 2: Increase Environmental Education

Positive Statements	Negative Statements
1. Will help get more support for wilderness areas (make minority the majority)	1. Takes too long
2. Will inform public of ecological dangers of overusing wilderness	2. Costs a lot
3. Emphasizes use of reason instead of power	
4. Increases appreciation of nature	

Solution 3: Seek Alternative Sources for Resources

Positive Statements	Negative Statements
1. Leaves scenic areas unscarred	1. Takes too long to locate alternatives
2. Encourages conservation of natural resources	2. Disrupts new areas
3. Stimulates new ideas on how to get resources	3. Leaves valuable resources in wilderness areas unused

Figure 8.7. Tom's solutions to wilderness area problems.

Tom's Observations and Recommendations

Observations

1. It will be difficult to preserve all areas that currently exist in their wilderness state, and still satisfy everyone's recreational needs.
2. Keeping a balance between pro and anti-wilderness demands can't always be settled by dividing a recreational area. Sometimes dividing an area up simply destroys its value to both sides.
3. Often decisions about the preservation of the wilderness are made on the basis of political pressures.
4. It is hard to settle wilderness preservation issues in a way that satisfies both the majority's and the minority's rights.

Recommendations

1. A national advisory board should be set up to determine what the country's recreation needs are likely to be. The board should make recommendations for needed laws to maintain wilderness areas in a way that will serve all of the people.
2. Until the board makes its recommendations, all lands designated as wilderness should be kept as they are.
3. Environmental education should be included in the curriculum, K - 12.

Figure 8.8. Tom's observations and recommendations.

Stage 6. *Conscience or Principle Orientation.* Looking to one's own conscience as a directing agent and to mutual respect and trust. Right is defined by the decision of conscience in accord with self-chosen ethical principles that appeal to logic. "At heart, these are universal principles of justice, of the reciprocity and equality of the human rights, and of respect for the dignity of human beings as individual persons."[30]

Like Piaget, Kohlberg argues that each stage builds upon the other, the first through the sixth, and that no stage may be skipped. Stage movement for each individual occurs in developmental fashion, but it may be accelerated or retarded.[31] Stage theory has been validated in cross-cultural studies; and with training in the use of coding protocols, it is possible to diagnose the dominant stage of an individual's moral reasoning.[32] Kohlberg maintains that most adults become fixated at (never move beyond) Stage 3 or 4.[33] While the dominant stage of moral reasoning *may vary for an individual in a given classroom,* the probabilities are that most elementary students will be at Stage 1 and 2 with some at Stage 3, and most secondary students will be at Stages 3 and 4, with some at 2, and a few at 5.

Empirical evidence has been collected by Kohlberg's associates to support the notion that stage acceleration may be engendered by providing moral reasoning at one stage above that of the child.[34] Individuals tend to be influenced by arguments representing one stage higher than their own; they are unable to understand (though they may prefer) arguments representing more than one stage above their own; and they reject those representing lower stages.[35] By engaging in dialogs with others at stages above one's own, Kohlberg assumes, fixation at a lower stage of reasoning will be prevented and upward movement facilitated.

The basis for all of the Kohlberg research is a series of moral dilemmas and related probe questions. Respondents are to resolve the dilemmas and share their rationale. Their thinking and discussion is prodded and sustained by the probe questions. In the research studies, the cumulative arguments of each respondent over a series of dilemmas are then coded and assessed with respect to stage dominance.

Moral dilemmas offer a novel opportunity for geographic educators to involve their students at any age in crucial issues and to make a contribution toward improving students' moral reasoning. The basic strategy is to present students with moral dilemmas centering around real or hypothetical issues and provide an opportunity to discuss them in groups; typical geography-related issues that might be used are population, pollution, and poverty. Let us consider the details of the strategy in two steps, the first involving criteria for constructing a dilemma, the second concerning the presentation and discussion of the dilemma.

Construction of a dilemma requires attention to at least the following basic points:[36]

1. The issue presented should offer only two basic choices. (Should A be done or should B?)
2. Both choices in the issue should be likely to attract some measure of support in the class.
3. There should be no one obvious or culturally approved answer to the issue.
4. The issue must be a question of what is right or wrong, involving conflict over what is a just course of action to take.
5. All the material necessary for consideration of the dilemma should be organized as succinctly as possible, with the moral issue brought into sharp focus.
6. The issue should be one with which students can readily identify and become involved.

For the presentation and discussion of a dilemma, the following procedures are suggested:[37]

1. Present the dilemma to students in the form of a handout statement, oral reading, role-play incident, maps/statement, or other media format.
2. Allow the students to take a position with respect to the issues raised in the dilemma. Organize them into discussion groups for this purpose.
3. Use a series of probe questions to follow up the dilemma, if necessary. They should challenge the students to reflect further and to look at facets of the issue. The probe questions also serve to keep the discussion on track, and to insure that questions relating the higher-stage arguments are injected into the discussion.

Two illustrations of using moral dilemmas in geographic education are offered here. The first, Happytown and Sadtown is designed for primary grade children.

Happytown and Sadtown. Begin by reading with the students "Happytown and Sadtown" (Fig. 8.9); supplement the reading with appropriate photographs if possible. In initiating and sustaining the discussion, questions such as the following may be used:

1. Should Happytown give up its park so that Sadtown people can build houses there?
2. Why do you think that is what they should do? Later, probe questions may be inserted into the discussions.
3. What if Happytown gives up its park? Will its people have any other place to have fun? If so, where?
4. What will happen to the people in Sadtown if they can't build new houses in Happytown?
5. How would you feel if you lived in Sadtown? Why?
6. Suppose the people in Happytown didn't like those in Sadtown. Then should they give up their park? Why?
7. What would you do if you lived in Happytown? Why?
8. Do the people in Sadtown have a right to ask Happytown to give up its park? Why?

Happytown and Sadtown

The people in Happytown really like their town. They have big yards and nice houses. (Refer children to an appropriate photo.) There is a fine, large park in Happytown, too. Both children and adults use the park a lot. Everyone has fun there.

Next to Happytown is Sadtown. The people in Sadtown have small yards. Their houses are not very nice. Mostly the children have to play in the streets. (Refer children to an appropriate photo.) There is no park. Many people in Sadtown would like to move to Happytown. But there are no more houses to buy in Happytown.

So the people in Sadtown want Happytown to give up its park. People could build houses on the parkland. Then people from Sadtown could move to Happytown. There is no other place besides the park to build new houses in Happytown.

The people in Sadtown want a nice home and a big yard. The people in Happytown do not want to lose their fine park.

Figure 8.9. Happytown and Sadtown.

After this phase of the discussion has run its course, the dilemma may be intensified by adding new details to the case, such as the following:

Happytown Decides

Happytown has decided to sell its park. Now the people in Sadtown will be able to build homes in Happytown. They will have nice homes and big yards.

Some people in Happytown are not happy about losing their park. They have gone to court. They want the judge to stop Happytown from selling its park. "The park belongs to everyone in Happytown," they say. "Happytown can't sell something that everyone wants and likes."

Some questions which might be posed to the students are:

1. What do you think the judge should do?
2. Should the judge let the park be sold to build houses? Should he let Happytown keep its park? Why?
3. Suppose the judge lives in Sadtown. Would he want the park to be sold?
4. Suppose the judge never uses the park. Will that make any difference about what he decides?

For older students dilemmas may be more complex—that is, they would contain more variables—and may require some basic research to arrive at decisions. Contemporary dilemmas might be built around topics such as placement of low-cost housing or the Alaska pipeline which would require the use and analysis of more complex geographic data. For instance, a series of recordings, *Issues in American Democracy*, published by H. O. Wilson Corporation, provides numerous opportunities for junior and senior high school students to confront moral dilemmas.[18] One dramatization focuses on employment versus environment.

Claytonville vs. Industry. In summary the case involves an incident between small industry and the town of Claytonville. The town originally wooed the industry as part of an economic expansion plan. To attract the industry, certain concessions were made, including provisions for waste disposal. Soon it becomes clear that the industry is seriously polluting the river which runs through the town, making it unfit for irrigation and recreation. It is established equally clearly, however, that the owner cannot afford to purify his wastes and still remain in business. The town wishes to have the benefits of the industry but also those of a pure river. What should be done? Additional discussion questions are provided by the authors of the series, and many of them can be applied directly to the moral dilemma framework discussed earlier.

In employing moral dilemma strategies, such as those above, it is important for the teacher to recognize that it is the quality or structure of an argument rather than its actual content that requires the most attention. One may, for example, resolve the preceding dilemma *either* in favor of the industry's rights or those of the town, by reasoning at any of the six stages. The *type* of reasoning and *not* the content or position determines the stage of moral reasoning. An important distinction between the moral reasoning strategy and that of value clarification is the assumption that higher stage reasoning constitutes a "more moral" response in a discussion. Viewed in this way, all opinions expressed in moral discussions may not have equal merit. The *reasoning* in some arguments may be approached as being more moral by the teacher, with the six-stage hierarchy providing the standards.

A teacher-education kit, designed to prepare teachers for using moral dilemmas has been developed by Guidance Associates; the following pointers on the teachers role in translating Kohlberg's theories draws from their materials.[39]

1. *Maintain the focus on the moral dilemma.* It is important to keep the students' attention on the dilemmas to make them grapple with the issue. Frequently they will try to avoid the dilemma by injecting reasonable but spurious solutions. In the case of Happytown presented earlier, the students may say, "The Sadtown people could move somewhere else." When children do this, the teacher should "gently" eliminate such compromises that avoid the dilemma by using any feasible strategies, e.g., a simple "There are no other areas for building."
2. *Help keep the arguments balanced.* When it appears there is convergence on one solution, raise questions that will give consideration to the other point of view and generate some conflict discussion. If all students feel Sadtown should be allowed to build in the park, the teacher might ask, "How would you feel if you lived in Happytown and had to give up the park in which you played everyday?"
3. *Encourage role-taking.* Whenever feasible, try to get students to identify with characters and feelings implicit in the dilemmas. "What would you do if you lived in Happytown?"
4. *Clarify the dilemma.* As necessary, recast or rephrase a dilemma to insure that the entire class understands it clearly.

Conclusion and Summary

Consideration of values must be an important instructional preoccupation of all geographic educators. All disciplines within the social sciences and sciences, including geography, intersect at some point with important value concerns. Philosophers, psychologists, and professional educators, each in their own way, have approached the study of values. Each author tends to perceive and define values in his or her own fashion, and this fact has contributed to much of the confusion surrounding the term. All who would be serious about dealing with values in the classroom should address themselves initially to this important definitional question.

While there is considerable national interest in the development of values, the schools apparently have had little effect on students' values. In the past, the prevalent approach in the schools has been to attempt value inculcation, supported with intraschool norms where possible and encouraged through role modeling. The results have not been impressive nor have the methods used been consistent with the dimensions of the task or the demands of a pluralistic society.

How then may geographic educators approach values education in a manner consistent with the integrity of their discipline and a spirit of free inquiry? The growing body of educational literature on values threatens to outdistance the number of volumes written on inquiry in the 1960s. Sorting out the useful instructional material will require some bench marks for a teacher. Four key questions that might be asked concerning any suggested approach to values in the classroom are:

1. Does it set forth explicit criteria for what constitutes a value?
2. Is it supported directly or indirectly by some research or experimentation or evaluation germane to classrooms?
3. Is there a growing body of theory upon which it is based?
4. Can it be used to create instructional strategies with a variety of topics?

This list is certainly not exhaustive, nor are all of the questions of equal importance. Certainly, questions 2 and 3 are the more critical ones. The questions, however, should provide a quick test of the relative merits of different approaches. A check of the four strategies discussed in this chapter will reveal the extent to which each merits an affirmative answer to the questions.

The chapter has not inventoried the total range of value-related strategies available to geographic educators. Rather, four alternative but complementary open-ended instructional approaches to values were outlined and illustrated with geographic data. (See Table 8.1.) Each approach provides relatively specific but flexible procedures for

TABLE 8.1
Selected Characteristics of Four Approaches to Value Education

	Primary Authors/Source	Perceptions of Values	Estimates of Probable Grade-Level Application
Value Clarification	Louis Raths and Associates	Defines a value as the results of proceeding through a seven-step process	4 to Adult
Value Survey	Milton Rokeach and Associates	Defines a value as a central belief about appropriate individual behavior or some end state worth or not worth attaining	3 to Adult
Value Analysis	1971 National Council for the Social Studies Yearbook Authors: Lawrence Metcalf, Editor	Focuses on value judgments—those which rate items with respect to their worth	9 to Adult
Moral Reasoning	Lawrence Kohlberg and Associates	Does not deal with values directly; rather focuses on cases involving right or wrong into which values will enter	All Levels

constructing value-related strategies. These may serve the reader not only as guidelines, but as stimuli to further, perhaps more definitive, models.

NOTES

1. John Dewey, *Theory of Valuation* (Chicago: University of Chicago Press, 1966), p. 1.
2. Ibid., p. 2.
3. See Abraham Kaplan, *The Conduct of Inquiry* (New York: Intext, 1964); May Brodbeck, ed., *Readings in Philosophy of the Social Sciences* (New York: Macmillan Co., 1968); Eugene J. Meehan, *Value Judgment and Social Science* (Homewood, Ill.: Dorsey Press, 1969); and Clyde Kluckhohn, "Values and Value Orientations in the Theory of Action," in Parsons and Shils, eds., *Toward a General Theory of Action* (Cambridge: Harvard University Press, 1951). For a succinct analysis of the various perspectives on values and their general relationship to scientific inquiry, consult John P. Robinson and Phillip R. Shaver, *Measures of Social Psychological Attitudes* (Ann Arbor, Mich.: Institute for Social Research, University of Michigan, 1969), pp. 405-18.
4. Kaplan, *Conduct of Inquiry*, p. 254.
5. For a summary of the issues in the literature on values, see Robinson and Shaver, *Measures of Social Psychological Attitudes*, pp. 410-15.
6. There is a plethora of educational books on the market that purport to deal with affect. An attempt at an operational definition of the term is made in Peter H. Martorella, "Selected Early Childhood Affective Curricular Materials: An Analysis of Theories, Structure and Internal Consistency," paper presented at the Annual Meeting of the College/University Faculty Association, National Council for the Social Studies, November 21, 1973. See also Martorella, *Elementary Social Studies as a Learning System*.
7. Louis Raths et al., *Values and Teaching* (Columbus, Ohio: Charles Merrill, 1966), pp. 9-10. See also G. Schrader, "The Status of Values in a Descriptive Science," *American Behavioral Scientist*, vol. 17 (September/October 1973).
8. The term "attitude," for example, has a specific meaning and an extensive body of literature attached to it in the domain of psychology. Educators have made far less precise distinctions among different dimensions of affect.
9. For a further discussion of this point, see Martorella, *Elementary Social Studies as a Learning System*.
10. Krathwohl and his associates have underscored this point: "We recognize that human behavior can rarely be neatly compartmentalized in terms of cognition and affect." See D. Krathwohl et al., *Taxonomy of Educational Objectives, Handbook II: Affective Domain* (New York: David McKay, 1964), p. 85.
11. While other approaches exist, these seem to have the most relevancy for geographic education.
12. Raths et al., *Values and Teaching*.
13. Ibid., pp. 28-30.
14. Ibid., p. 30.
15. Ibid., pp. 83-84.
16. Raths et al., pp. 84-111, passim.
17. For related geographic content see Donald W. Maxfield, "Spatial Planning of School Districts," *Annals of the Association of American Geographers*, vol. 62 (December 1972).
18. Milton Rokeach et al., *The Open and Closed Mind* (New York: Basic Books, 1960); Milton Rokeach, *Beliefs, Attitudes and Values* (San Francisco: Jossey-Bass, 1968).
19. Rokeach, *Beliefs*, p. 113.
20. Ibid., pp. 112, 116.
21. Ibid., p. 124.
22. Ibid.

23. Milton Rokeach, *Value Survey*, distributed by Halgren Tests, 873 Persimmon Ave., Sunnyvale, Calif. 94087, copyright, 1967.
24. Milton Rokeach and D. Daniel McLellan, "Feedback of Information about the Values and Attitudes of Self and Others as Determinants of Long-Term Cognitive and Behavioral Change," *Journal of Applied Social Psychology*, vol. 2 (1972), p. 250.
25. An excellent alternative city is Harlow, England. Material appropriate for secondary students is available in J. G. Rushby et al., *People and Places: Case Studies in World Geography, Book 5* (Chicago: Rand McNally & Co., 1971).
26. Lawrence E. Metcalf, ed., *Values Education*, 41st Yearbook of the National Council for the Social Studies (Washington, D.C.: National Council for the Social Studies, 1971).
27. Jerrold R. Coombs, "Objectives of Value Analysis," in *Values Education*, p. 2.
28. James Chadwick and Milton Meux, "Procedures for Value Analysis," in *Values Education*, p. 76-77.
29. Lawrence Kohlberg, "Stage and Sequence: The Cognitive-Developmental Approach to Socialization," in *Handbook of Socialization Theory and Research*, David A. Goslin, ed. (Chicago: Rand McNally & Co., 1969), pp. 347-480.
30. Lawrence Kohlberg and Elliot Turiel, "Moral Development and Moral Education," in *Psychology and Educational Practice*, G. Lesser, ed., (Chicago: Scott, Foresman & Co., 1971), p. 416.
31. Ibid., pp. 448-50.
32. Ibid., 436-39.
33. Kohlberg, "Stage and Sequence," p. 384.
34. Elliot Turiel, "Stage Transition in Moral Development," in *Second Handbook of Research on Teaching*, Robert M. W. Travers, ed. (Chicago: Rand McNally & Co., 1973), pp. 732-58.
35. Ibid., pp. 742-58.
36. For a discussion of other important considerations in constructing dilemmas, see Carol Gilligan, "Moral Education: A Developmental Approach," in *Guide to Teaching/Moral Reasoning* (Middletown, Conn.: American Educational Publications, 1972), p. 3.
37. Ann Colby, "Writing Moral Dilemmas," unpublished paper, Harvard University, no date, pp. 3-7.
38. Janice Wagner and Chris Wagner, *Issues in American Democracy* (South Holland, Ill.: H. O. Wilson Corp., 1967).
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9

Teaching Geography Through Field and Archival Methods

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Two ways in which students can investigate geographic phenomena are discussed in this chapter. Considered first is field study, which means direct, firsthand observation of the phenomenon by the student-investigator. Examined second is archival study, which means the analysis of materials such as books, maps, air photos, census reports, and so forth. Throughout the chapter "primary source information" will be used to identify information gathered in the field by the student-investigator and "secondary source information" to identify information gathered by someone else.

The discussion of field study and archival study rests on two assumptions. First, there is the assumption that geographic learning will be enhanced through direct, firsthand contact with the phenomena under study. As Woodruff states: "All learning begins with some form of personal contact with objects, events, or circumstances in life."[1] The authors believe that firsthand experiences reinforce and facilitate comprehension of geographic ideas and development of geographic skills. Therefore, the authors suggest that field study is a necessary condition for geographic learning.

Second, it is assumed that geographic learning proceeds most effectively when archival study and field study are used in a concurrent, complementary fashion. (See Fig. 9.1.) Geographic ideas and skills should be developed in the field, but they must also be supported by information from archival sources. It is geographic ideas and skills which help the student structure and interpret reality; it is field study and archival study which provide the information and experience necessary to validate and develop those ideas and skills. Students need the opportunity to investigate geographic problems both directly from the field, and through secondary information just as the researcher does—to observe, to question, to hypothesize, to examine, and to explain.

Field Study

Field study refers to any firsthand observation of geographic phenomena, generally out of the classroom—on the school grounds, in the neighborhood, or beyond. Virtually all geographic educators believe that field study can lead to significant

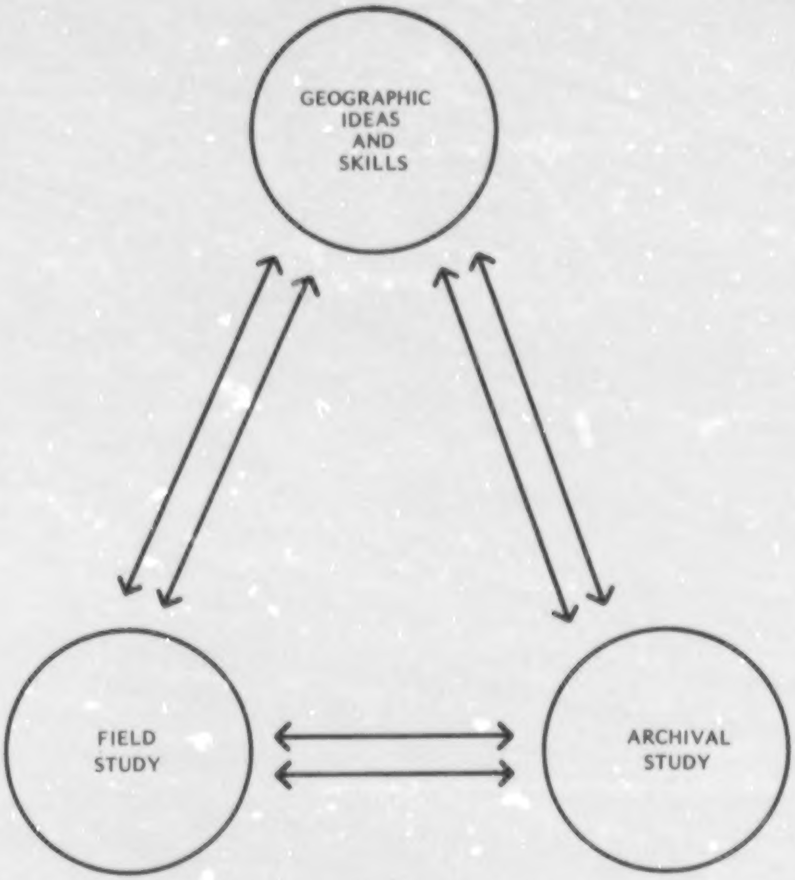

Figure 9.1. Relationship among geographic ideas and skills, field study and archival study.

geographic learning. For instance, Anderzhon and Newhouse state: "The purpose of teaching geography out-of-doors is to develop an awareness of the patterns and areal associations of physical and cultural features, and to build skills in observing and recording this kind of information."[2] Briault makes a comparable claim:

> The climax value of geographic field work lies in the training it gives in enabling pupils to look at a landscape geographically, in giving them an eye for the country. Once gained, this power is a treasure which transforms any journey and makes the surface of the earth a never-ceasing source of interest and intellectual stimulus. Though this power can be greatly developed by study and map work, it depends primarily on field experience.[3]

Similar statements are found throughout the literature on geographic education. But belief in field study as a useful strategy for geographic education has not led to its adoption and implementation as an integral part of the curriculum in American schools. This seems unfortunate because virtually all of the important geographic ideas and skills can be taught and learned through field study of the most convenient and immediate setting—the local area. Concepts such as location, distance, spatial interaction and environment are manifest in the neighborhood as well as in distant lands. In fact, they can only have meaning if experience-based Skills such as map making and map reading can be taught at the neighborhood scale as well as the global scale. Applying such ideas and skills to problems such as urban sprawl, land use conflicts, traffic problems, and recreational planning should help the student understand the place where he lives and should facilitate further geographic learning.

In spite of its access to students and teachers, the local area seems somehow to be more inconvenient for the teacher to direct the study of than remote parts of the world. Consequently, to most students, the local environment remains an unassorted assemblage of phenomena, objects, and events with only the most superficial understanding of the functions of various components of the community and the spatial interaction between them. With some well-guided activity, students can become acquainted with the area and can begin to feel comfortable with their own observations and inquiry. Hill puts it this way:

> When the student understands that the subject matter can be found in the local area, the sanctity of the printed word is not a threat to his inquiry, and he is more likely to ask critical questions and to formulate original ideas than when his attention is riveted to a textbook. Furthermore, when concepts are formulated from directly sensed perceptions, the links to the "real world" are explicit, personal, and direct, and the student is more likely to make further "real world" applications of those concepts.[4]

To be meaningful, field study must be approached from a problem point-of-view, with a theoretical base. There ought to be some framework on which to observe, gather data, and analyze results. The conceptual and theoretical framework in geography is stronger now than it has ever been. The time is right for teachers of geography to turn to the field with their students, during this era of environmental awareness and need for understanding.

Field study may take many forms—ranging from casual observation in the simplest form to sophisticated and intensive investigation. Although this range covers a continuum of increasingly rigorous procedures, we might, for simplicity, identify two categories—the field trip and the field investigation. The distribution between the two is similar to the distinction between expository and inquiry instruction modes. In the field trip the student is largely a receiver of information provided by the teacher or others conducting the trip, although some personal inquiry may be involved. In the field investigation the student is the inquirer and discoverer of information, although some basic information is necessarily given. As was indicated in Chapter 1, learning by the student follows essentially the same steps as those followed by the researcher—identifying a problem, gathering information or data (sometimes the first two steps run together), analyzing the information, comparing the results with existing theories or ideas, and drawing conclusions. The same is true of both the field trip and the field investigation. The latter, however, is usually more formally expressed and more rigorously pursued. This sequence of "learning steps" suggests an instructional strategy that needs to be explicitly spelled out in the field investigation. Identifying the problem and the related theory is important. The class needs to understand the purpose of the investigation so that they know what they are looking for and why.

The Field Trip

Field trips are planned excursions to sites beyond the classroom for the purposes of illustrating geographic concepts and principles and obtaining geographic information. While field trips may accomplish other important educational objectives such as developing students' ability to cope with new settings and enhancing students' interest in the local community, the primary concern here is the contribution of field trips to geographic learning.

Lewis has suggested five reasons for conducting field trips. First, the field is the geographer's laboratory, the source of the facts and observations which will determine the validity and utility of his ideas. Second, the field is the only place where students can be shown what only could be talked about in the classroom, thus providing a unique opportunity to dramatize and reinforce learning. Third, field trips can provoke questions unlikely to arise in the classroom and develop new ways of looking at the world. Fourth, they can breed ideas and stimulate the imagination, which may be attributable to the intensity and diversity of the stimuli encountered on field trips. Finally, field trips can develop the understanding that the landscape is a system of interrelated parts, not a collection of objects and events, a justification for field trips which Lewis believes is the most compelling of the five offered.[3] To illustrate how a teacher might secure the benefits envisioned by Lewis, we shall describe how a field trip was organized and conducted by a high school class studying the geography of Pennsylvania.[4]

The course was organized around major regions of Pennsylvania. As each region was studied, a field trip lasting from one to several days was conducted in that region. Each trip emphasized selected geographic ideas and stressed particularly the observation and analysis of the man-land dimension of the region's geography. The lengthiest excursion was a five-day field trip through eastern Pennsylvania which culminated the course as well as the school year.

Preparations for the trip began with a thorough study of the region. Its geology, topography, and climate were examined. Ways in which the environment influenced human activity as well as ways in which it had been transformed were considered. The resources of northeastern Pennsylvania were reviewed and its economic base analyzed. Students pored over maps and spent many hours doing library research on significant topics and places in the region. Thus, their trip would be conducted with adequate preparation.

The itinerary was planned jointly by the class and the teacher. It included the Pocono Resort Region, the Anthracite Region, and the Northeast Dairy Region. The students prepared a brief geographical description of each region in the form of a brochure, which also served as a "trip log." Copies of the brochure were distributed to parents. In brief, the trip included visits to a slate quarry, a coal mine, a dairy farm, a cement plant, a knitting mill, a candy factory, and the state capitol building. Students observed physiographic phenomena such as kames, potholes, drumlins, coral reefs, and water gaps. They heard presentations by resident local authorities on such topics as the geology and history of northeastern Pennsylvania, and the origins and customs of the Pennsylvania Dutch. Perhaps the most enlightening moment of the trip occurred during an evening at the home of a Mennonite farmer, where students enjoyed a family-style dinner that included seven sweets, seven sours, and seven desserts. The meal was prefaced by a short prayer and hymn service by members of the family. The evening ended with a question-and-answer period about Mennonite customs and their faith.

The logistics of this extended field trip were not overwhelming and were facilitated by intensive student involvement in all phases from planning to debriefing the trip. Overnight accommodations were obtained in an American Youth Hostel. (Elsewhere, state parks, YMCA camps, college dormitories could be used.) Menus were planned with the school dietitian and prepared by student "cooking crews." Transportation was provided by a chartered bus and the group was chaperoned by teachers, parents, and the school nurse.

Field trips need not be so extensive. Often, the local area contains easily accessible examples of geographic phenomena which teachers can use to reinforce previous learning or to generate students' interest in new geographic topics and problems. For instance, if the subject under discussion is a drainage basin the teacher could take students into the field and point out such physical features as a divide, tributary system, drainage pattern, meander, ox-bow lake, delta, or demonstrate the concept of stream gradient as it affects stream velocity and sediment transport and deposition.[7] In addition to seeing examples of these concepts, the students could learn to make meaningful and significant associations that enable them to see how many of the apparently isolated parts of the drainage basin form a highly functional system. The field is also an appropriate setting for a wide-ranging discussion of complex questions related to the drainage basin. For example, what changes appear to have occurred in the drainage basin? What may happen in the future? How might these changes influence the economic activities? How is the stream being used by man? What land uses are associated with various parts of the stream system from headwaters to terminus? How might economic activities influence the vegetation and wildlife found in the basin? What problems may arise as the stream and its tributaries continue their headward erosion? Does the stream suffer from local pollution and can these sources be traced? This same drainage basin also could provide an excellent setting for the students to study the generation of hydroelectric power. Damming and stream gradient lend themselves to a general discussion of power generation, the energy issue, flood control, recreation, and navigation schemes.

Upon returning from a field trip, it is essential that the class reflect on the experience. For instance, students could apply ideas associated with their local stream system to remote places discussed in their text. They could pose questions and problems which may have occurred to them during the trip. They could organize and report the information obtained on the trip to other classes and parents. They can compare field notes, maps, and answers to questions. Such follow-up activities are judged as important as the preparation of the actual trip itself.

The Field Investigation

Whereas field trips are oriented toward expository teaching and reception learning, field investigations are oriented toward inquiry teaching and discovery learning.[8] The field investigation approach to field study suggests that:

1. The student engages in some kind of inquiry, or an ideational or informational search focused on a question to be answered or a problem to be solved.
2. The student makes a discovery, perceives a casual relationship, states a generalization, or predicts an outcome.
3. The teacher stresses the skills, techniques, and processes of investigation such as analysis, hypothesis testing and generalizing, rather than the acquisition of information.[9]

Underlying field investigation is the familiar scientific method—stating a problem, surveying relevant literature, formulating hypotheses, gathering and analyzing data, and drawing conclusions.[10]

While students should become adept scientific investigators, the scientific method should not be regarded as a rigid formula, or series of steps to be followed mechanically by teachers and learners. Rather, the scientific method is a flexible and powerful way of attempting to understand an intransigent reality.[11] In the following example of a field investigation, the scientific method served as a guide for teachers and learners as they grappled with a practical problem facing their community.

The field investigation involved the availability of parking facilities in an urban community. To anyone living in the community it was readily apparent that a parking problem existed, particularly in the downtown area, but its spatial and temporal dimensions had not been studied systematically. In other words, it was not known how the number of vacant parking spaces varied from place to place and from time to time. However, if such information were available planning officials should be able to make recommendations for better utilization of existing facilities and to make decisions about new parking areas. The field investigators, the students, undertook the task of securing this data.

The study was initiated by an effort to determine if previous investigations of the parking problem had been conducted. Often such studies are part of most major urban planning studies and can be obtained from the city planning agency. Several surveys of parking in other cities were obtained but no studies of this community had been conducted. This "review of literature" raised some broad, general questions that provided direction and focus for the investigation. For example, should on-street as well as off-street parking be considered? Is it important to collect and analyze data according to the hours of the day and the day of the week? Is the time of year important in utilization of parking facilities? In addition, by examining previous studies of the same topic, students acquired ideas about techniques for acquiring and organizing their data as well as potential solutions to the parking problem.

The next step involved the construction of several hypotheses to be investigated. For example, it was expected that fewer parking spaces would be available during specific hours of the day such as from 4:00-6:00 p.m. and on certain days of the week, particularly Saturday. It was also expected that parking spaces nearest to the major retailing outlets of the community in the central business district would fill before those spaces further away. However, those spaces which were most convenient to the shopping district would probably be more expensive with higher parking meter and parking lot rates. Therefore, it was proposed that cost of parking would influence the availability of parking spaces but that beyond a certain distance from the heart of the business district, people would not utilize free parking precisely because it was too far away. But what was that distance?

Now for the field work. Initially, it was necessary to construct a map showing the number and location of existing parking spaces. To obtain this information the downtown area of the city was surveyed and the number and location of parking spaces was plotted on a large-scale base map of the city. Once this map was constructed, observation teams were assigned to observe the utilization of various parking spaces.

After it was determined which spaces were occupied for what periods of time on which days, the data were tabulated and maps were constructed. The maps revealed parking areas that motorists were not fully utilizing as well as areas that were being over-utilized, i.e., motorists competing for vacant spaces. Other aspects of the study, which are not discussed in this chapter, revealed parts of the city that needed more parking facilities; further investigation into the availability of vacant land, traffic movement, major office buildings, and so forth led to recommendations for additional parking development. Upon completion, the study was turned over to the local planning commission who utilized the results to plan for improved on- and off-street parking. In the process the students learned something about city form and function, site and situation, land use and property value, and the meaning of spatial interaction.

Another type of study which lends itself to field investigation involves the construction of maps showing land-use patterns in the community.[12] A land-use map by itself shows little more than the distribution of social and economic activities; however, when one attempts to discover how concentrations of similar activities have evolved and tries to associate those patterns with public policy and social problems, the land-use map can take on new meaning. For example, a land-use map might reveal zones of potential conflicts such as the encroachment of a commercial district into a single-family dwelling area or areas suffering from visual blight through a high intensity of outdoor advertising.[13] Land-use maps can also be constructed in a way that will reveal how a community has grown through time and space. For instance, students can examine the architectural styling of homes in various sections of the city, determine when particular types of homes were built, and eventually map the housing by time periods, thus identifying residential regions of the city by historical eras. Students can then extend the study to predict how the city will expand, what the housing of the future will look like and where it will be. Associating the general direction of future growth with other spatial variables, such as vacant land, transportation routes, zoning laws, and physical restrictions such as steep slope and flood plain areas will give students a new perspective on the dynamic nature of residential land use in the city.

Many geographers interested in spatial interaction analyze the movement of goods, people, and ideas between points in space. A group of students can begin to develop an understanding of spatial interaction by investigating phenomena such as major patterns of traffic movement in the city. During the investigation, students might be encouraged to ask why the intensity of traffic flow varies throughout the city as it does, and to consider the implications of the flow patterns as they vary throughout a 24-hour period. With this information and insight, students could evaluate the placement of school guards, traffic lights, crosswalks, and other traffic controls. Not only would they learn important geographic ideas but they also would see how those ideas can be applied to "real world" problems.

Archival Study

In recent years there has been an increasing use of secondary sources of information by geographers as well as teachers. With growing numbers of investigators and improved techniques for data gathering, the volume and reliability of such information is expanding rapidly. Further, the conceptual and methodological development of geography has advanced so that often it is possible to formulate and solve problems worthy of geographic investigation through secondary sources of information. The purpose of the ensuing discussion is to explore some of these secondary sources of information and to suggest some teaching-learning activities based on them.

Characteristics of Secondary Information

Secondary information refers to any information utilized by the investigator but not obtained by him through direct personal observation. Among the types of secondary information frequently used by geographers are maps, photographs, census reports, journals, and field notes. Even artifacts from the area of study may be used.[14] It should not be inferred that secondary information is inferior to primary information. In fact, secondary sources are often the only way some information can be obtained, even in the local community. It may seem at first that there is no need for secondary information in the study of the local area, where things may be observed firsthand, obtaining primary information from field study. Imagine, however, trying to map the town yourself, or taking your own aerial photo, writing the history, obtaining all the economic data, and so on. It is neither possible nor feasible to try to gather all relevant information about the local area by personal observation, measurement, and recording. Secondary information is not only helpful in augmenting personal observation, but is generally essential.

The forms of secondary information range from concrete and tangible to abstract and symbolic. For instance soil samples are tangible whereas a soils map is much more abstract. Both are secondary information and are potentially useful to the investigator despite the fact that he did not collect the samples or make the map.

Secondary information also varies according to the degree of "editing." A photograph records things the way they are." The only editing involved is through a camera position, etc. A conventional vertical aerial photograph is essentially unedited. The very purpose of such a photo is to record things as they are, with ideal lighting conditions and a vertical camera position to make the photo as near planimetric (map-like with uniform scale) as possible. The same is true of a satellite image, although the amount of detail shown is much less. A map, however, is considerably edited. Only specific items from the area are selected and presented in symbol form. The user is at the discretion of the cartographer's purposes, criteria, and standards of accuracy. Documentary information, such as censuses and government agency reports generally are the least edited of the written forms. However, the user needs to be aware of the sampling technique used in the gathering of the information. Historical accounts are generally intended to be documentary also, but the sources and reliability of information are more limited and therefore lead to considerable editing and/or speculation. Written accounts of the present landscape are also highly selective and edited. The user is subject to the scope and objectivity of the writer's observation and presentation. Value judgments need constantly to be made by the user as to the credibility and accuracy of such written accounts. Finally, a novel or essay is perhaps the most edited of all written accounts in that it expresses highly personalized experiences and feelings. Still these forms of information may be very useful for a student to obtain a sense of identification of the area, the people, and conditions of the place under study.

Secondary information also varies according to the degree of areal or spatial order in the data presented. Maps and vertical aerial photos are designed by their very nature to appear in areal order, with uniform or near-uniform scale. Census tables reflect a kind of areal order in that data are gathered by political units. It is easy to turn to the table dealing with your state, country, or census tract. Narrative documents and reports ars generally more difficult to place in spatial order. Some historical, economic, or environmental accounts are written with areal order in mind, which provides for general orientation. But most narratives are remarkably unspecific in this regard. Areal or spatial order are fundamental to geographic study. The map is generally the most effective device for displaying geographic data.

The type of secondary data sought depends on the nature of the investigator's study. Some studies call for a high degree of unedited reality with clear areal order and great detail. Other studies, or aspects of study, may be less demanding in these regards but call for a highly humanistic interpretation of the environment or the place. The teacher, in guiding such inquiry, needs to be sensitive to the array of secondary materials needed, as determined by the nature of the problem or investigation, in order to seek and obtain systematically the data from appropriate sources. There are times when a generalized view from a satellite image provides just the right overview of an area that can only be obtained in that way; a thousand aerial photos covering the same area would add needless detail and expense. In other instances a building-by-building survey of the Central Business District or a detailed vegetation map, or other detailed information will be required.

For meaningful geographic learning, the inquiry should be problem oriented.

Gathering information on "all there is to know about . . ." may be a satisfactory beginning, but there must evolve a concept-based structure for the data to be organized around. Otherwise the class is involved in assembling volumes of unrelated data, leading to more confusion of geographic concepts and methodologies than elucidation of them. The search ought to begin with some general questions in mind, and proceed to more specific conceptual order.

As mentioned earlier, secondary information is essential for studying the local area as well as distant places. Inasmuch as there are several fine sources describing the study of local area geography, the examples presented in this chapter are limited to techniques for studying distant places.[16] Regarding distant places, secondary information will be the only information available to the investigator. Most places in the world fall into the distant places category. Obviously it is impractical for the students to visit numerous distant places for the purpose of obtaining firsthand information. Instead secondary sources must be used.

Preparing to Study Distant Places

You prepare to help students learn the geography of distant places by studying distant places yourself. Begin by collecting maps of the area and becoming familiar with its "place-name geography." Next, read as much as you can about the place. How many people are there? What are their characteristics and culture? Is the population growing or declining? Information about the economy is also desirable. How do these people make their living? Heavy industry? Tourism? Agriculture? Is the economy flourishing or declining? Are economic development efforts underway? Acquire social, religious, linguistic and ethnic information, for these factors clearly affect the occupance of an area. For instance, who lives where is often a function of race, ethnicity, and social condition. Such information may also help you understand conflicts that may be occurring in that place. Investigate the quality of the human environment. For instance, what about its buildings? Do the residents tend to live in single-family dwellings or apartments? Are they new or old? Are they in good repair? What style are they? Investigate the buildings in which they work, the schools their children attend, and their cultural centers. Finally, the natural environment should be studied because man's activities and settlements do not exist apart from nature. They relate to the terrain, vegetation, streams, and climate as well as to culture and society. Frequently, such natural forces have played extremely important roles in the origins and growth of nations and communities.

Now you could do all of the necessary geographic research, acquire this information, and then transmit your findings to the students. The class would probably cover much material that way, and learn a great deal about the place in question. However, they would only be learning about your learning. We believe they need to experience the process of geographic inquiry, which means finding out for themselves just as you did. Therefore, we will present ideas for acquiring information about distant places in ways which students themselves can accomplish. Among the anticipated learning outcomes of the activities presented in the following pages are:

1. Increased proficiency with the library and library research procedures

2. Improved team research techniques
3. Greater understanding of basic geographic concepts such as scale, spatial interaction, and region
4. Enhanced skills of data collection, data analysis, and research presentations
5. Satisfaction of a productive and successful investigation
6. Expanded information known about the place under study

Three Approaches to Studying Distant Places

In the remainder of this chapter we illustrate an approach to studying a distant place by obtaining secondary information from three general sources—from the local archives where you live, from the distant place itself, and from third-place sources. We will use the example of a geography class studying Minneapolis-St. Paul, Minnesota from Cincinnati, Ohio; thus three variations of the approach are:

1. Acquiring information in Cincinnati about Minneapolis-St. Paul
2. Acquiring information directly from Minneapolis-St. Paul
3. Acquiring information about Minneapolis-St. Paul from sources other than Cincinnati or Minneapolis-St. Paul

It is anticipated that in order to maximize the learning opportunity, to strengthen the attitude of systematic inquiry, and to obtain a comprehensive understanding of Minneapolis-St. Paul, all three variations would be used.

Using local sources. The simplest way for a class to study a distant place is to utilize its own local resources for relevant material. (See Fig. 9.2.) Local libraries would be a logical place to begin. Students may think libraries are dull places until they discover the many different kinds of information that they contain and learn the fascinating ways of discovering and using such information.[17] The first step in this activity is involving the total class in "brainstorming" the questions: "What kind of information do we want about Minneapolis-St. Paul?" and "Where in the library can we locate such information?" Answers to the latter question should result in a listing of information sources to be searched. Second, teams of students could be organized to examine particular sources. The third step is developing and implementing a plan for carrying out the team research tasks—who goes where, for what information, and when.

Specific tasks might include:

1. Checking the general card file under Minneapolis-St. Paul, Minnesota, the Midwest, and so forth.
2. Examining the *Guide to Periodical Literature* to determine if there are any publications which have articles about Minneapolis-St. Paul.
3. Reviewing reference books which might contain information about Minneapolis-St. Paul. These should include statistical publications, almanacs, atlases, encyclopedias, dictionaries, history and area studies, and local guidebooks.

Checklist for Local Sources of Information about Distant Places

_____ public and university libraries for books, periodicals, films, and Minneapolis-St. Paul telephone book

_____ local Chamber of Commerce and local field office of U.S Department of Commerce

_____ local travel agencies

_____ local newspaper for information about newspapers in Minneapolis-St. Paul

_____ local news shops for current Minneapolis-St. Paul newspapers

_____ local offices of large Minneapolis-St. Paul based companies

_____ local office of large national moving van company

_____ officials of large local companies that have a branch in Minneapolis-St. Paul

_____ airlines, railroads, and bus companies connecting with Minneapolis-St. Paul

_____ local county agent of U.S. Department of Agriculture

_____ local automobile club for maps and booklets on Minneapolis-St. Paul

_____ local U.S. Weather Bureau

_____ admissions department of local university to get names of students in local area who are from Minneapolis-St. Paul

_____ friends and acquaintances who have lived in or visited Minneapolis-St. Paul

Figure 9.2. Checklist for local sources of information about distant places.

Each team should report its initial findings to the entire class. Not only should they tell *what* they found, but also *how* they found it, including their problems; obviously, the class can learn from problems as well as the successes.

By this time enough preliminary and overall information is gathered that some structure can be introuced into the investigation—conceptualizing the form of the city, the functions of the city, its natural setting, trends in development, linkages to other places, and so on. This kind of ordering of the information gathered so far is essential to give structure and meaning to the remainder of the investigation. Otherwise an attitude of rambling miscellaneousness pervades the whole inquiry and perpetuates an impression that geography is an undisciplined discipline concerned only with aimless gathering of data.

A surprising amount of urban geography can be learned by examining the classified advertising pages of telephone directories. Many public and university libraries maintain a collection of telephone directories for major cities. You may have students check to see if the Minneapolis-St. Paul directory is available. (If the library does not have one, the local telephone company may be able to supply one.) Using the classified section of the telephone book, the student can learn much about the spatial, social, and economic aspects of Minneapolis-St. Paul. In addition to the categorical headings found in the "yellow pages," there is usually an abundance of factual information about the community and its environs to be found in other sections of the telephone directory, including total population, major industries, transportation lines and routes, communication services and miscellaneous items.

First, the class could list the major activities conducted in cities, e.g., education, industry, recreation, business, social service. Next, groups of students might be assigned to locate each of these functions by using the yellow pages to find the street address of all the facilities, organizations, or agencies belonging to their specific functional category. Using an appropriate symbol or color code, the students then locate these institutions on a map of Minneapolis-St. Paul.[18] This may be done either on a separate map for each category or on a large wall map showing all the categories. (If a large wall map is used, it would be best to use both symbols and color codes.) After the mapping is completed, the students may be asked to examine and discuss various relationships and locational patterns of the categories such as:

1. Location of educational institutions, distinguishing levels from elementary to college
2. Distribution of recreational facilities and open space areas
3. Distribution of industry, distinguishing between heavy and light
4. Distribution of commercial centers, including suburban shopping malls
5. Location of cultural attractions serving the entire community
6. Spatial relationship of health agencies and institutions (i.e., clinics, hospitals, long-term care units, convalescent homes)
7. Patterns of social service organizations (including welfare agencies, neighborhood centers, community councils, fraternal associations, etc.)
8. Arrangement of transportation facilities, distinguishing between railroad, highway, airport, and water transportation facilities

By this time the study should be evolving into rather specific objectives, emphasizing the fundamental concepts and methodologies of geography as a spatial science.

Using sources at the "distant place." The following exercises employ techniques of studying distant places from the local community by searching sources located in the distant place. In this case, the basic strategy is to visit an information source for Cincinnati, obtain the name and address of a similar information source in Minneapolis-St. Paul, and then contact that source in Minneapolis-St. Paul.

Planning commissions and newspapers provide much information about communities. Therefore, one group of students could contact the Cincinnati Planning Commission and obtain the name and address of the planning commission for Minneapolis-St. Paul. They would write that commission and request a copy of the latest "master plan," several copies of the latest detailed map(s) of the Minneapolis-St. Paul metropolitan area and other materials relevant to urban development in the area. Meanwhile, another group of students could visit the offices of the newspapers in Cincinnati. There they might obtain the names and addresses of the publishers of the newspapers in Minneapolis-St. Paul and subsequently subscribe to those papers. Upon receipt of the materials from the planning director and sufficient issues of the newspaper, students could display and discuss the maps, review the master plan document and examine copies of the newspaper, searching for articles concerning urban problems, spatial structure, and the city environment.

To establish sources for historical information about Minneapolis-St. Paul, a third group of students could contact the Cincinnati Historical Society where they might obtain the names and addresses of historical societies in Minneapolis-St. Paul. They could contact these societies and obtain as much historical information as possible. Upon receipt of these materials, these students might prepare a written summary with appropriate maps of the historical geography of Minneapolis-St. Paul, from initial settlement to the present, and prepare a map depicting the geographical distribution of historical sites.

Many other sources could be contacted for information, including various industrial firms, the utility companies, the Chamber of Commerce, the travel council, federal offices such as the Environmental Protection Agency and the U.S. Weather Service, state agencies such as the State Planning Office, and various agencies of city government such as the water department, the water reclamation department, the solid waste disposal office, parks and recreation, social services, transportation, and so forth. Data may be available in the form of annual reports, brochures of projects and programs, maps, plans, etc. Any information derived from such offices would typically be current and dynamic, reflecting current trends and issues in the Minneapolis-St. Paul area.

Using third source techniques. In this section we discuss techniques for obtaining information about distant places by using "third-location" sources. Third-location sources are those found neither in the home city nor in the city being studied but rather in some other place. Third-location sources are especially important for obtaining maps, air photos, and weather information.

There are numerous sources from which students can obtain maps of an area. Topographic maps can be acquired by writing to the Map Information Office of the United States Geological Survey (U.S.G.S.), Department of the Interior, Washington, D.C. 20242 and, in this case, requesting the index to topographic maps for the State of Minnesota. The students should receive from the Map Information Office not only the index pamphlet requested but a map of Minnesota which shows the sections mapped, the year they were mapped, and the names of those sections. Further, they will receive in the same packet a complete list of all Minnesota topographic maps, their name, scale, size, cost, and how they may be purchased.

Numerous other sources of maps of the Minneapolis-St. Paul area exist. For information about soil maps of the Minnesota-St. Paul area students should contact the Educational Relations Section, Information Division, Soil Conservation Service, U.S. Department of Agriculture, Washington, D.C. 20250. For a navigation chart of the upper Mississippi River, they should write the U.S. Army Corps of Engineers, 536 Clark Street, Chicago, Illinois 60605. A listing of historical maps of the Minneapolis-St. Paul area is provided in *A Guide to Historical Cartography* which can be purchased for 35 cents from the Card Division, Library of Congress, Washington, D.C. 20541. Maps of geologic formations of Minneapolis-St. Paul can be obtained through the U.S. Geological Survey at the address listed above.

With these maps in hand students might explore such concepts as site and situation, terrain and topography, geological origins and structures, soil types and distributions, extent of urbanized area, history of areal growth, and so on. They might investigate topics such as the relationships between terrain and certain soil types. Or how does the population distribution of urbanized areas vary with distance from the CBD? Does the configuration of the Mississippi River provide any clues to the initial as well as the subsequent settlement patterns?

Aerial photographs can be obtained in much the same way as maps. The principal source of air photos is the Map Information Office of the U.S. Geological Survey at the address listed above. U.S.G.S. publishes a free folder telling about aerial photos and aerial mosaics, where they may be obtained and which ones are available through the U.S. Department of Agriculture. The photos themselves cost approximately $1.75 each for a 9" × 9" print; other sizes are available. Satellite images may be obtained from the EROS Data Center, U.S. Geological Survey, Sioux Falls, South Dakota. Black and white prints or color infrared composites may be ordered in 9" × 9" (1:1,000,000) format.

With air photos students should practice identifying objects and patterns such as factories, drive-in theaters and residential areas. They should also answer questions about spatial interactions that are likely to take place between various points of the study area. Satellite images are especially useful in illustrating the regional setting of the city since one image covers 100 miles by 100 miles of area, or 10,000 square miles. The air photos and satellite images can be studied in conjunction with the maps, thereby increasing the potential for additional geographic conceptualization. You may wish to prepare slides of the air photos or images. In this way the entire class can study the same aerial photographs at the same time.

The U.S. Weather Service publishes daily weather maps which may be obtained on a subscription basis. One subscription may be sufficient or you may desire multiple copies in order to make class study easier for more students. (Subscription requests should be sent in at least one month in advance of the time needed.) The class can study the weather patterns for Minneapolis-St. Paul and note how they compare with their home area as well as other parts of North America. Students could also contact a meteorologist in the local area and have him talk to the class about the weather patterns in the Minneapolis-St. Paul area. If a visit to the school is not feasible, the students might interview the meteorologist at his place of work. A discussion on how weather there affects daily life, recreation, and transportation, season by season would be useful.

Extending These Ideas

The examples used two major United States metropolitan areas and the national capital, but these techniques are valid for acquiring information about all types of places and areas. This system of using sources within the home community, sources within the community under study, and sources external to both, can be employed for many types of locational analyses, including urban and rural, large place and small place, and national and international.

Assume that you are located in El Dorado, Kansas (population 30,000) and you were interested in learning about the existing conditions in Florence, Kentucky (population 10,000). In El Dorado you could visit Butler County Library and the local office of the telephone company. Further, you could write to the office of the Boone County, Kentucky Planning Commission to obtain a copy of the city of Florence's Master Plan, and a map of the city of Florence. You could subscribe to the Boone County Recorder, substituting a weekly perusal of a newspaper instead of a daily reading. You could correspond with the Christopher Gist Historical Society and the Behringer Museum, both located in northern Kentucky. You could utilize the same "third-source" data sources presented in the earlier examples, plus a few more. You could travel the twenty odd miles to Wichita and utilize the resources of the library of Wichita State University. You might also correspond with such state offices in Frankfort, Kentucky, as the Kentucky Department of Commerce, Bureau of Public Information, or the Kentucky Department of Agriculture. In short, the trilogy of information source locations can be utilized to conduct a data search for smaller communities within the United States as well as the larger metropolitan areas. You may change focus, from urban-oriented agencies such as county or state agricultural departments, but the search process remains basically the same.

What about international study? Assume that the geographic investigator is located in the United States and wishes to learn about the conditions in Baphur, India. Using the trilogy of locational data sources, he might proceed in the following manner. The public library in the local area is still the place to begin and the search would be conducted as outlined earlier in this chapter. If a college or university is nearby, a search of its faculty and student directories may provide the name of a student or faculty member who is a native of India. A possible local source might be a religious group, organizations, and institutions that sponsor missionary projects in India, or the Baphur region.

A search for possible sources of data within India must consider the language barrier. Therefore, likely sources might be the American Embassy or Consulate in either Delhi or Baphur, and the offices of news services such as the Associated Press and United Press International. If you wished to correspond directly with members of the indigenous population you might try a high school class at one of the Indian high schools operated by the Jesuits, or a public school. The provincial headquarters of the Society of Jesus can be contacted by calling any Jesuit institution listed in the local telephone book. Contact with an Indian public high school could be established through the Ministry of Education, New Delhi. The provincial headquarters could then supply the names and locations of its members serving in missions in India. They can be contacted at their International Office at John F. Kennedy Airport in New York City, or at any of their regional offices located in major cities in the United States. Check the yellow pages of any large city telephone directory.

To locate other third-place sources the investigator might correspond with international organizations such as:

1. United Nations Association of the United States of America
   Publications Services
   833 United Nations Plaza
   New York, New York 10017

   From this source, publications and educational materials are available on the various activities and agencies of the United Nations.

2. National Geographic Society
   17th and M Streets, N.W.
   Washington, D.C. 20036

   Teachers may request publications and learning aids from the School Services Division of the Society. These materials will aid comparative area studies throughout the world.

3. National Education Association (NEA)
   1201 - 16th Street, N.W.
   Washington, D.C. 20036

   The NEA can provide assistance in locating sources of educational materials and teaching aids.

The Appendix to this chapter contains additional sources of information about distant places. Included are lists of film and photo sources, map sources, aerial photo sources, statistical and reference data sources, and a representative list of national and international atlases. Finally, there is a selected bibliography of material suggesting class projects as well as additional sources of reference information. It is hoped that these lists will stimulate your creativity, and encourage you to go beyond this guide by fashioning your own individualized approach to using secondary sources in geographic learning.

Appendix: Selected Sources of Information

Sources for Films and Photos

Most public libraries have film departments. Check with them to see if they have films on the subject in which you are interested. Also check with the librarian for film sources. The librarian will have the names of suppliers and their catalogues. Check your local telephone directory for rental film libraries near you. In addition to commercial films available on geographic subjects, many government agencies have films also. Many United States agencies have films dealing with cartography and aerial photography. A partial list follows:

Pan American Institute of Geography and History
Agency for International Development Films
  The Information Office
  U.S. Geological Survey
  Washington, D.C. 20242

U.S. Air Force Films
  USAF Film Library Center
  8900 South Broadway
  St. Louis, MO 63125

U.S. Army Films

First Army Governors Island New York, NY 10004	For those living in New England, New York, and New Jersey
Second Army Ft. George G. Meade, MD 20755	For those living in Pa., Md., Va., Ohio, W.Va., Ky., and Del.
Third Army Ft. McPherson, GA 30330	For those living in southeastern United States
Fourth Army Ft. Sam Houston, TX 78234	For those living in Ark., Tex., Okla., N.M., and La.
Fifth Army 1660 East Hyde Park Blvd. Chicago, IL 60615	For those living in Ill., Ind., Ia., Mich., Wis., Mo., Minn., Nebr., S.Dak., N.Dak., Wyo., and Colo.
Sixth Army Presidio of San Francisco San Francisco, CA 94129	For those living in Calif., Ariz., Ore., Wash., Id., Mont., Utah, and Nev.
Military District of Washington Washington, D.C. 20025	For those living in the District of Columbia

U.S. Lake Survey Films
  District Engineer
  U.S. Army Engineer District
  Lake Survey
  630 Federal Building
  Detroit, MI 48226

Canadian Films
Information Canada
Ottawa, Ont., Canada

British Films
Central Office of Information Central Film Library
Government Building
Bromyard Avenue, Acton
London, W. 3, England

The following agency produces catalogues of films and filmstrips made by all producers of material for teaching purposes. Part 3 deals with general, physical, and economic geography; part 4 with regional geography.

The Educational Foundation for Visual Aids, Ltd.
33 Queen Anne Street
London, W. 1, England

Color Prints of Geographical Landscapes of the World
I.V.A.C.
37 rue de Linthout
Bruxelles 4, Belgium

Map Sources

Map Information Office U.S. Geological Survey (USGS) Washington, D.C. 20242	Has information on all federal government maps
Superintendent of Documents Government Printing Office Washington, D.C. 20402	Sells federal maps published by small federal agencies, such as Weather Service, Census Bureau, etc.
Geography and Map Division The Library of Congress Washington, D.C. 20540	Has a reference service for its 3 million maps; also sells map reproductions and bibliographies
Publications and Sales Branch The National Archives and Records Service General Services Administration Washington, D.C. 20403	Sells photo reproductions of maps of all types, plus special lists and inventories
Distribution Division, C-44 Coast and Geodetic Survey Rockville, MO 20852	Sells aeronautical and related charts and maps, mainly of foreign areas

Commanding Officer Army Map Service ATTN: 16230 Washington, D.C. 20315	Sells topographic and military maps of foreign areas and strategic U.S. areas
Bureau of the Census U.S. Department of Commerce Washington, D.C. 20233	Sells census maps
Coast and Geodetic Survey Environmental Science Service Administration U.S. Department of Commerce Rockville, MD 20852	Sells nautical and aeronautical charts of U.S. and its possessions
Lakes Survey District Corps of Engineers 630 Federal Building Detroit, MI 48226	Sells nautical charts of the Great Lakes and connecting waterways
U.S. Army Engineering Division Ohio River Corps of Engineers 10th Floor, Federal Office Building 550 Main Street P.O. Box 1159 Cincinnati, OH 45201	Sells navigation charts of the Ohio River and its tributaries
Lower Mississippi Valley Division Corps of Engineers P.O. Box 80 Vicksburg, MS 39180	Sells navigation charts of lower Mississippi Basin
Corps of Engineers 536 Clark Street Chicago, IL 60605	Sells navigation charts of the upper Mississippi River and its tributaries
Omaha District, Corps of Engineers 6012 U.S. Post Office and Court House Omaha, NB 68102	Sells navigation charts, recreation maps, and topographic sheets of Missouri River Valley
U.S. Army Engineers District 700 Federal Office Building 601 East 12th Street Kansas City, MO 64106	Same as above
Forest Service U.S. Department of Agriculture Washington, D.C. 20250	Sells all types of maps dealing with national forests and wilderness areas

Distribution Section U.S. Geological Survey Federal Center Denver, CO 80225	Sells topographic maps for U.S. areas west of the Mississippi River (including all of Minnesota and Louisiana)
Distribution Section U.S. Geological Survey 1200 South Eads Street Arlington, VA 22202	Sells topographic maps for U.S. areas east of the Mississippi River
Commander U.S. Naval Oceanographic Office Washington, D.C. 20390	Sells hydrographic and aeronautical charts of foreign areas
Naval Oceanographic Distribution Office U.S. Naval Supply Depot 5801 Tabor Avenue Philadelphia, PA 19120	Sells charts, kits, and catalogues of oceanographic material to purchasers east of the Mississippi River
Naval Oceanographic Distribution Office Clearfield, UT 84016	Same as above, but for purchasers west of the Mississippi River
Information Division Soil Conservation Service U.S. Department of Agriculture Washington, D.C. 20250	Sells soil surveys and maps
Weather Service U.S. Department of Commerce Washington, D.C. 20235	Information on weather maps and meteorological publications
American Geographical Society Broadway at 156th Street New York, NY 10032	Publishes several series of small-scale maps of the world or large regions
National Geographic Society 17th and M Streets, N.W. Washington, D.C. 20036	Publishes political maps of all sections of the world

Sources for Air Photos

Cartographic Branch National Archives and Records Section General Services Administration Washington, D.C. 20408	Has U.S. federal aerial photographs taken prior to 1941
Map Information Office U.S. Geological Survey Washington, D.C. 20242	Has information on all U.S. federal government aerial photographs

Aerial photographs made by the United States government may be purchased from the following agencies. Their names designate fairly well what photos they handle.

Aerial Photography Division
Agricultural Stabilization and Conservation Service
U.S. Department of Agriculture
2222 West 2300 South
Salt Lake City, UT 84119

For photos and satellite images of the United States and satellite images of the world

Cartographic Unit
Soil Conservation Service
U.S. Department of Agriculture
Federal Center Building
East-West Highway and Belcrest Road
Hyattsville, MD 20782

Forest Service
U.S. Department of Agriculture
Washington, D.C. 20250

U.S. Geological Survey
U.S. Department of the Interior
Washington, D.C. 20242

Map Information and Records Unit
Tennessee Valley Authority
110 Pound Building
Chattanooga, TN 37401

U.S. Coast and Geodetic Survey
U.S. Department of Commerce
Washington Science Center
Rockville, MD 20852

Bureau of Land Management
U.S. Department of the Interior
Washington, D.C. 20242

Committee on Aerial Photography
University of Illinois
713 South Wright Strest
Champaign, IL 61820

Has many U.S. aerial photos and stereograms from various federal agencies

Foreign Air Photographs

National Air Photo Library
Department of Energy, Mines, and

Has aerial photographs

Resources of Canada
615 Booth Street
Ottawa, Ont., Canada

Director Air Division
Surveys and Mapping Branch
Department of Lands, Forests, and Water Resources
Victoria, B.C., Canada
Has aerial photos of British Columbia

Library, Aerofilm, Ltd.
4 Albemarle Street
London, England
Has aerial photos of Great Britain

Space Aerial Photographs
Still Photo Productions, Inc.
318 H Street, N.W.
Washington, D.C. 20001

Technology Application Center
University of New Mexico
Box 181
Albuquerque, NM 87106

Atlases

Atlases are revised and updated frequently; check for the most recent edition of each title.

Classroom Atlas. Rand McNally & Co., Chicago.
Man's Domain: A Thematic Atlas of the World. McGraw-Hill Book Co., New York.
Oxford Home Atlas of the World. Oxford University Press, London and New York.
Goode's World Atlas. Rand McNally & Co., Chicago.
John Bartholomew. *Physical World Atlas.* American Map Co., New York.
Medallion World Atlas. Hammond Inc., Maplewood, N.J.
International Atlas. Rand McNally & Co., Chicago.
Atlas of American History. Oxford University Press, London and New York.
Atlas of European History. Oxford University Press, London and New York.
Atlas of World History. Rand McNally & Co., Chicago.
Philips' Soviet Atlas. George Philips, London.
Philips' China in Maps. George Philips, London.
Gailey, Harry A., Jr. *The History of Africa in Maps.* Denoyer-Geppert Co., Chicago.
Concise Atlas of the British Isles. Oxford University Press, London and New York.
Oxford Regional Economic Atlas of the United States and Canada. Oxford University Press, London and New York.
Dalfus, Jean. *Atlas of Western Europe.* Rand McNally & Co., Chicago.

Statistical and Reference Data Sources

American Geographical Society, Library. *Research Catalog.* 15 volumes and map supplement; G. K. Hall, Boston.

British government publications may be obtained from the sales office of Her Majesty's Stationery Office
York House, Kingsway, London, W.C. 2
A monthly catalogue is available by subscription. H.M.S.O. also issues a series of section catalogues listing the publications of various government departments. Copies are free.

Canada Today. Statistics Canada, Information Canada, Ottawa. Published annually.

Economic surveys of many countries may be had free by writing
Barclay's Bank D. C. O. Ltd.
54 Lombard Street
London, E.C. 3, England.

Harris, Chauncey. *Bibliographies and References for Research in Geography.* Department of Geography, University of Chicago, Revised edition, 1967.

Index. *National Geographic.* National Geographic Society, Washington, D.C.

Lock, N. B. Muriel. *Geography: A Reference Handbook.* Archon Books and Clive Bingley, Hamden, Conn., 1968.

Readers' Guide to Periodical Literature. The H. W. Wilson Co[illegible] York. Vol. 1 to date.

The Statesman's Yearbook. St. Martin's Press, New York. Published annually since 1864.

United Nations Educational, Scientific, and Cultural Organization. *Statistical Yearbook.* Imprimerie Joseph Floch, Fortenoy, France. Published annually since 1963.

United Nations Food and Agriculture Organization. *Production Yearbook.* United Nations, Rome. Published annually since 1946.

United Nations Statistical Office, Department of Economic and Social Affairs. *Demographic Yearbook.* United Nations, New York. Published annually since 1948.

United Nations Statistical Office, Department of Economic and Social Affairs. *Statistical Yearbook.* United Nations, New York. Published annually since 1948.

United Nations Statistical Office, Department of Economic and Social Affairs. *World Economic Survey.* United Nations, New York. Published annually since 1947.

United Nations Statistical Office, Department of Economic and Social Affairs. *Yearbook of International Trade Statistics.* United Nations, New York. Published annually since 1957.

United Nations Statistical Office, Department of Economic and Social Affairs. *Yearbook of National Accounts.* United Nations, New York. Published annually since 1957.

United Nations World Health Organization. *Annual Epidemiological and Vital Statistics.* United Nations, Geneva. Published annually since 1948.

U.S. Bureau of the Census, Department of Commerce. *Statistical Abstract of the United States.* Washington, D.C.: Government Printing Office. Published annually since 1878.

———. *U.S. Census of Agriculture.* Decennial and mid-decennial publications.

———. *County and City Data Book.* Published annually since 1961.

———. *U.S. Census of Population.* Decennial publication since 1970.

U.S. Department of Agriculture. *Agricultural Statistics.* Published annually since 1866.

Walters, Susan, ed. *Canada Almanac,* Pitman Publishing Co., 1971.

Winchell, Constance M. *Guide to Reference Books,* American Library Association, 7th ed., 1951, with supplements.

World Almanac. Newspaper Enterprise Association, New York. Published annually since 1868.

Secondary Source List

Whom to contact in the United States:

1. Public library and many other libraries in the area
2. Historical society
3. Chamber of Commerce
4. Map Information Office
5. Local automobile club
6. County records
7. President and/or public relations person of large company in that area
8. Travel agencies
9. U.S. Department of Agriculture, Soil Conservation Service in that area
10. Newspaper in that area
11. Planning commission in that area

Whom to contact in Canada:

1. Information Canada
2. Vicar or Rector of the Parish
3. Clerk of the Parish Council
4. Clerk of the Rural District Council
5. Transport Commission
6. Local gas, electric, water, and river boards
7. Secretary, Public Records Office, London
8. Victoria County Histories
9. Saxon Charters
10. All else same as United States

Annotated Bibliography

American Students and Teachers Abroad: Sources of Information about Overseas Study, Teaching, Work, and Travel. DHEW Publication No. (OE) 72-196. Washington, D.C.: Government Printing Office, 1972. General international information for teacher and student.

Corey, Kenneth E. et al. *The Local Community: A Handbook for Teachers.* New York: Macmillan Co., 1971. Uses the inquiry approach to learning geographic concepts; local-area sources of secondary information are treated in depth.

Corey, Kenneth E. "The Role of Field Work in Geographic Research and Instruction," in *Field Training in Geography*. Commission on College Geography Technical Paper No. 1. Washington, D.C.: Association of American Geographers, 1968, pp. 2-10. Comparison of the similarities and differences between geographic instruction and research in using primary field information.

Corey, Kenneth E. "Using Local Resources in Developing Geography Concepts and Understandings," *Social Education*, vol. 30 (December 1966). Brief list of research and resource methods.

Durrenberger, Robert W. *Geographical Research and Writing*. New York: Thomas Y. Crowell Co., 1971. Contains a detailed section on using the library.

Garnier, B. J. *Practical Work in Geography*. London: Edward Arnold Publishers, 1964. Techniques for mapping and map interpretation.

Haddon, John. *Local Geography*. London: George Philip and Son, 1965. British source material and projects.

Handbook on International Study for U.S. Nationals. 5th ed. New York: Institute of International Education, 1974. A useful teacher and student resource for area and non-area international information.

Jackson, J. N. *Surveys for Town and Country Planning*. London: Hutchinson and Co., 1963. British source material.

Kingsbury, Robert C., Chairman, Committee on Maps and Aerial Photographs, Association of American Geographers. *Sources of Information and Materials: Maps and Aerial Photographs*. Washington, D.C.: Association of American Geographers, 1970. Detailed lists of map, aerial photo and film sources, particularly for the U.S., but includes foreign, too.

Long, M., ed. *Handbook for Geography Teachers*. London: Methuen and Co., 1965. A mine of information sources for regions and subjects all over the world.

Lord, Clifford L., ed. *Teaching History with Community Resources*. New York: Columbia University Press, 1964. U.S. project ideas.

Wanless, Harold R. *Aerial Stereo*. Chicago: T. N. Hubbard Scientific Co., 1965. Lists and sources of aerial photo material.

Whitener, D. J. *Local History—How to Find and Write It*. Asheville, N.C.: Western North Carolina Historical Association, 1955. Brief but good guide with many project suggestions.

Wright, Marion I. *Providence: A Metropolitan Region*. Providence, R.I.: Providence School Department, 1970. Sample community study of a large metropolitan area.

Wurman, Richard Saul. *Making the City Observable*. Minneapolis: Walker Art Center, 1971. Sources for unusual maps of the world's major cities.

Wurman, Richard Saul, ed. *Yellow Pages of Learning Resources*. Cambridge, Mass.: MIT Press, 1972. Excellent source for project ideas as well as for sources of information.

NOTES

1. Asahel D. Woodruff, *Basic Concepts of Teaching* (San Francisco: Chandler Publishing Co., 1961), p. 66

2. Mamie L. Anderzhon and Hazel R. Newhouse, "Teaching Geography Out-of-Doors," in *New Viewpoints in Geography*, ed. Preston E. James, 29th Yearbook of the National Council for the Social Studies (Washington, D.C.: National Council for the Social Studies, 1959), p. 177.
3. E. W. H. Briault, "Outdoor Geography," in *Handbook for Geography Teachers*, ed. M. Long (London: Methuen and Co., 1964), p. 61.
4. A. David Hill, "Learning Geographic Concepts in the Local Area: An Introduction to Geography through Field Work," in *Field Training in Geography*, Commission on College Geography Technical Paper 1 (Washington, D.C.: Association of American Geographers, 1968), p. 15.
5. Peirce F. Lewis, "On Field Trips in Geography," in *Field Training in Geography*, pp. 53-54.
6. Also see Nancy Louise Evans, "Holiday for Learning," *Pennsylvania School Journal*, vol. 108 (Nov. 1959); Robert N. Thomas, "An Extended Geography Field Trip," *Journal of Geography*, vol. 60 (Jan. 1961) pp. 16-20; and Thomas, "Capturing the Imagination and Channeling the Energies of Youth thru a Junior Geography Club," *Journal of Geography*, vol. 58 (Dec. 1959), pp. 451-65.
7. For a discussion of these concepts as well as drainage basins in general, see Arthur N. Strahler, *Introduction to Physical Geography*, 3rd ed. (New York: John Wiley & Sons, 1973), pp. 149-66.
8. See Chapters 6 and 7 for discussion of inquiry teaching/discovery learning and expository teaching/reception learning, respectively.
9. John Jarolimek and Juber M. Walsh, *Readings for Social Studies in Elementary Education*, 2nd ed. (New York: Macmillan Co., 1969), pp. 183-84.
10. Lloyd Haring and John F. Lounsbury, *Introduction to Scientific Geographic Research* (Dubuque, Iowa: Wm. C. Brown Company Publishers, 1971).
11. Refer to Chapter 5 for an insightful discussion of the "scientific method" as it relates to teaching and learning.
12. For a discussion of land use maps, see Raymond E. Murphy, *The American City*, 2nd ed. (New York: McGraw-Hill Book Co., 1974), Chapter 12.
13. For further discussion of aesthetic pollution see Peirce F. Lewis, "The Geographer as Landscape Critic," in *Visual Blight in America*, Commission on College Geography Resource Paper 23 (Washington, D.C.: Association of American Geographers, 1973), pp. 1-21.
14. For other sciences an artifact would generally be considered primary information. But geography, being basically an observational science, rather than experimental, where the phenomena being observed is an *area* rather than an object, any object recovered by someone else would be out of context of the area of occurrence, and therefore, secondary information.
15. A photograph taken by the investigator would, of course, be primary information. A photograph taken by another person would be secondary information.
16. See, for example, *The Local Community: A Handbook for Teachers* (New York: Macmillan Co., 1971); and Herbert H. Gross, *The Home Community* (Oak Park, Ill.: National Council for Geographic Education, n.d.).
17. Robert W. Durrenburger, *Geographical Research and Writing* (New York: Thomas Y. Crowell Co., 1971), pp. 41-50.
18. For a suggestion on how to obtain this map, see above.

10

Toward Geographic Literacy: Objectives for Geographic Education in the Elementary School

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Western Michigan University

A comprehensive educational program involves many kinds of subject matter and learning experiences. This paper discusses the role of geography in the elementary school. Part 1 reviews two goals of elementary education—intellectual development and social education. From these goals, specific objectives for geographic education are derived and presented in Part 2. Part 3 is a checklist intended to help answer the question, "To what extent are these objectives reflected in the programs, practices, and outcomes of elementary education?" For those who wish to go beyond this paper, an annotated bibliography is provided in Part 4.

Part 1: Geography and Elementary Education

Geography has been an integral part of elementary education for almost two centuries. Both geography and education have changed a good deal during those years, but there still is a familiar ring to the geography taught and learned long ago. Consider, for instance, the "gazeteer geography" characteristic of many American schools during the 1820s.[1]

> CERTIFICATE
>
> Elizabeth Crane hath been engaged, during her attendance at this school, in storing her memory, that strong and capacious storehouse of mankind, with useful ideas, lessons and information generally.
>
> She hath repeated the principal divisions, oceans, islands, etc., and answered 109 ques-

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> tions on the map of the world. She hath recited the principal divisions, lakes, rivers, bays, gulfs, etc., and answered 141 questions on the map of North America.
>
> She hath defined the boundaries of 12 of the United States and repeated 95 of the chief towns and 33 of the principal rivers belonging to these 12 states and answered 86 questions corresponding to the geography of that fine country.
>
> On the map of South America, she hath committed to memory the different countries belonging to that great peninsula and repeated 58 chief towns and 33 of the principal rivers and answered 39 questions corresponding with its geography.
>
> Let no one say, hereafter, that females cannot learn, for that is an assertion without foundation. Elizabeth is living proof to the contrary and she merits the approbation and encouragement of her parents and friends.
>
> Morristown, New Jersey (signed) P. Warden
> March 8, 1826

A century later geography in the elementary school had evolved into the study of "lands and peoples." Children still learned place locations, but more attention was given to the environments and cultures found in strange and wondrous places.[2]

> In my mind's eye I see them yet, sweeping like a moving mirage over the silent emptiness of the Sahara. These were the nomads, the only true dwellers of this greatest of the world's deserts . . . I recall the father, irascible leader, his stern face bronzed and creased by the searing sun, continually moving his family and his herds like a lost seaman over the interminable ocean of sand. But most of all, I remember young Ismail, faithful guardian of his father's flocks. What a marvelous lad! It was Ismail who could find pasture when starvation seemed imminent. It was Ismail who swiftly warned of danger when the sky took on a yellowish cast, certain sign of the coming of the chergui—that devastating wind from the southwest that stirs up sand, withering and smothering everything in its path. And it was Ismail who knew that our only salvation at the time of the chergui was to throw the center post of the tent to the ground, where, crouched together beneath the heavy camel hair fabric of the flattened tent, we waited the storm.

Today, geography continues to be a prominent part of elementary education, but it is not the geography of the 1820s or the 1920s. Children learn place locations and they study lands and peoples, but now geography is combined with other disciplines, such as economics, anthropology, and sociology, into a "social studies" curriculum.[3]

> In one classroom, children are moving around to a number of pupil-oriented donut shops, trying to decide where the best and cheapest donuts can be purchased. In another classroom, pupils have been studying business growth in the old hometown and they are getting ready to interview businessmen about their decision to locate their business in a nearby shopping center rather than downtown. In a fifth grade classroom, the children are comparing American and Eskimo views of death and opining as to which group is more humane. Elsewhere a class has just viewed a film vividly depicting the pressing problems of American cities and is now listing on the chalkboard several hypotheses concerning what caused these problems. Subsequently, they will divide into interest groups with the task of collecting information regarding these various tasks.

Two Goals for Elementary Education

Whether geography, economics, anthropology, or sociology, the role played by any discipline in the curriculum of the elementary school is a reflection of the goals of elementary education. Not surprisingly, these goals have changed during the past 200 years. The colonial school was expected to teach children how to read and understand the principles of religion and the capital laws of the country, a goal involving little geography. During the nineteenth century the elementary school assumed responsibility for general education, which not only provided for reading, writing, arithmetic, and history, but also required children to acquire a knowledge of places. Then, a gazeteer geography and, later, lands-and-peoples geography became part of the elementary school curriculum. By the early twentieth century, the goals of the elementary school expanded to include education for citizenship, and geography became part of a multidisciplinary curriculum centered on preparing children to become loyal and informed members of society.[4]

Today, the goals of elementary education include basic skills, general education, and citizenship. They also range across physiological, psychological, sociological, and ethical domains. Not uncommonly, elementary schools list psychomotor proficiency, self-fulfillment, and moral education as well as competency in reading, writing, and arithmetic among their aims. Some critics lament this diversity of purposes, arguing that no single institution can accomplish or should assume all these responsibilities. However that may be, it is clear that the purposes stated for elementary education in the latter part of the twentieth century are diverse, complex, and difficult to achieve.[5]

The goals may range across a wide spectrum, but two are shared by virtually all elementary schools—intellectual development and social education. In general, intellectual development is taken to mean the acquisition of important information, the mastery of basic skills, the comprehension of significant ideas, and the honing of thinking abilities. Social education is taken to mean the analysis of social problems, the examination of personal and social values, and the ability to make choices and decisions. Unfortunately, intellectual development and social education sometimes are regarded as separate and incompatible educational goals. For example, some curricula have stressed information, skills, ideas, and thinking abilities but neglect social issues, whereas other curricula stress problem solving, value analysis, and decision making but ignore fundamental facts, concepts, and competencies. Yet, intellectual development and social education can be complementary and compatible. Specifically, intellectual development can be aimed at effective and responsible citizenship, while social education can be predicated on a firm foundation of accurate, powerful knowledge. It is this latter view of the reciprocal relationship between intellectual development and social education which underlies this paper.[6]

One way to link and pursue intellectual development and social education effectively and efficiently is through the selection of curriculum subject matter and learning experiences that lend themselves to the attainment of both goals simultaneously. It is likely that many different themes can be developed in this manner, but the "places" theme seems particularly suitable for the intellectual development and social education of young children. From the perspective of social education, problems associated with such places as the neighborhood, community, state, nation, and world are significant and interesting. From the perspective of intellectual development the facts, ideas, and skills required to understand places are important and useful contributions to children's cognitive growth. It is for this reason that the objectives proposed in this paper are structured around the "places" theme.

Part 2: Objectives for Geographic Education

The objectives for geographic education proposed in this paper are organized into four categories—objectives related to factual learning, objectives related to skill learning, objectives related to ideational learning, and objectives related to more complex intellectual processes. Each category is discrete in the sense that somewhat different teaching/learning strategies are involved; but underlying these objectives is a unity arising from the interdependence of the facts, skills, ideas, and processes needed to understand places. For this reason, no category of objectives should be construed as more or less important than the others, nor is any particular curriculum sequence implied by the order in which the objectives are presented.

Four general points should be made regarding educational objectives. First, the number of objectives that could be derived from any discipline, including geography, vastly exceeds the number of objectives that can be accommodated in the elementary school. Our principal criterion for selecting the objectives listed below was their contribution, in important and substantial ways, to the intellectual development and social education of children. In addition, three more specific criteria were applied:

1. Does the objective reflect the geographic discipline? In other words, is it "good" geography?
2. Does the objective reflect social realities? In other words, is it "useful" geography?
3. Does the objective reflect the psychological development of children? In other words, is it "learnable" geography?

Second, educational objectives are statements of intended learning outcomes. That objectives are intentions does not mean they are always achieved nor that unintended learning does not occur. Objectives merely identify the hoped-for outcomes of instruction and provide some notion as to what is desired as a consequence of educational experience. Ultimately, what is learned depends on what is experienced by the child, not what is intended by the teacher or the curriculum developer. The key to geographic education is the provision of recurrent, diverse, and rich opportunities for learning.

Third, educational objectives can be stated at several levels, including the lesson level, the unit level, and the grade level.[7] In this part of the paper, we identify broad objectives for the elementary school curriculum. From these objectives, grade-level, unit-level, and lesson-level objectives may be derived. The precise scope and sequence of objectives at these more specific levels will depend on local needs and circumstances, but a comprehensive program in geographic education will contain instruction and experiences in each of the areas identified.

Finally, it is our opinion that attainment of these objectives will contribute to the intellectual development and social education of children. We would prefer to offer objectives grounded in research demonstrating these linkages rather than in professional opinion merely asserting this to be the case. Unfortunately, the status of research in geographic education does not permit us to submit much evidence in support of what we believe to be true.[8] However, we are not overly embarrassed by the paucity of data linking geographic learning with intellectual development and social education. Virtually every other facet of the educational enterprise is in similar circumstances. Until the data are "in," which is not likely in the foreseeable future, informed professional judgment must suffice.

1.0 Children Should Learn Important and Useful Facts About Places

Most people agree that children should learn facts, but there is little agreement on which facts are most important. It is a fact that the high temperature in Lansing, Michigan, on October 29, 1976, was 38°F. It is also a fact that the largest city in Michigan is Detroit. Are both facts important? Is neither important? Is one more important than the other? Are these facts more important for some children, say residents of Michigan, than for other children? These are difficult questions and they have yet to be answered satisfactorily. But some answers, however tentative, must be provided because factual learning is important and it cannot be ignored in the classroom.

1.1 Children Should Learn the Location of Places.[9] Intelligent, informed citizens know where important places are located. Toward that end, children in elementary school should begin learning place locations. Younger children might learn the locations of important physical, economic, and cultural features in their local area. Older children might learn the names and locations of the states and larger cities of the United States as well as the continents, oceans, and major nations of the world. Children need not emulate Elizabeth Crane, but "whereness" is part of geographic literacy.

Location can be expressed in two basic ways. The first, called "absolute" location, derives from coordinate systems and is reflected in activities such as locating Chicago with a map grid system. The second way of locating a place, called "relative" location, derives from that place's position vis-á-vis other places. The relative location of Chicago includes its position at the southern end of Lake Michigan, which provides water access to the heart of the continent. Chicago's relative location also includes its position in the center of the United States' agricultural interior and at the apex of a major industrial region.

1.2 Children Should Learn the Characteristics of Places.[10] A place has qualitative characteristics as well as a location. What is this place like? is a question as important as, Where is this place?

Two kinds of place characteristics ought to be stresssd. Facts related to magnitude are important because they, like facts concerning location, help children develop a spatial framework for the world around them. Younger children can learn, for instance, how to compare two local areas such as the playground and park by pacing around them and determining which is larger. Older children can learn more sophisticated techniques of measuring local areas, and they can begin acquiring factual information about the size of more distant areas. Specific numbers are less important than approximations—for example, "The United States and China are roughly the same size" or "The top of Mount Everest is almost six miles above sea level."

Facts related to significant physical, cultural, and economic features should be taught as patterns. More important than specific temperatures on particular days, for instance, are facts about the seasonal patterns of temperature in a particular place. Similarly, facts about the numbers of people in different places can be taught and learned as a spatial distribution pattern; facts about resource utilization can be taught as an economic development pattern; and facts about landforms can be taught as a physiographic pattern.

2.0 Children Should Learn Fundamental and Significant Ideas About Places

Ideas help children organize facts and interpret their experiences.[11] Through the acquisition of powerful, useful, and meaningful ideas, children will understand better the "bloomin', buzzin' confusion" around them. No idea will be comprehended fully by a child, but the elementary school is the place to begin teaching ideas that will help children understand the world in which they live. Among the sources of useful and powerful ideas are the various scholarly disciplines. From geography come ideas that will help children understand places—in particular, ideas concerning the relationships between people and their surroundings and ideas concerning the spatial organization of their society. These two sets of ideas do not exhaust the content of the geographic discipline, but they do represent central themes in geographic inquiry.[12] More important, however, is their contribution to helping children comprehend and deal with the world around them.

2.1 Children Should Learn the Meanings and Relationships of Population, Environment, Organization, and Technology. Understanding the relationship between people and their surroundings involves many ideas, but four are paramount—population, environment, organization, and technology.[13]

Population refers to the people occupying a place. Among the significant attributes of a population are number, distribution, growth and decline, and migration. Less tangible but equally important characteristics are the beliefs, perceptions, and experiences of a particular population.

Environment includes natural phenomena such as landforms, climate, soils, vegetation, water, and wildlife, which are themselves interdependent phenomena. Current usage in geography extends the meaning of environment to include man-made phenomena such as houses and highways. Churchill's remark that we shape our cities but our cities also shape us acknowledges the man-made facet of the environment, and it also calls our attention to the intimate relationship between people and their surroundings.

Organization derives from the fact that individuals are not equipped to live in isolation from each other; consequently, human activity usually involves organization of various kinds. Of special importance is economic activity and organization because production, consumption, and exchange of goods and services occur in places, vary from place to place, and are affected by the nature of the place in which they occur.

Technology refers to the sum total of knowledge, skills, tools, and techniques developed to satisfy human wants and needs. In groups characterized by smaller numbers and less complex social organization, the technology may be fairly simple and incapable of modifying the environment in drastic ways. Larger groups with more complex social organization tend to utilize more potent technology and often recreate, and occasionally destroy, their environment. Changes in technological capability not only affect the environment but also may influence population and social organization. Examples range from the automobile, which radically transformed population distribution, to the Industrial Revolution, which drastically modified the economic geography of western Europe.

2.2 Children Should Learn the Meanings and Relationships of Spatial Distribution, Spatial Association, Spatial Interaction, and Spatial Process. Many geographers believe that a spatial perspective on places is the distinguishing feature of their discipline.[14] However that may be, developing a spatial perspective on the world around them will facilitate children's intellectual development and social education, for the spatial component of intelligence is well-documented and the spatial elements inherent in such social problems as transportation and urbanization are evident. Thus, the spatial perspective has a role to play in elementary education, despite its absence from many classrooms and most curricula.

Among the ideas relevant to the spatial perspective are distribution, association, interaction, and process.[15] These ideas can be applied to any phenomena, but population, environment, organization, and technology ought to be emphasized. In this way, ideas related to people and their surroundings and ideas related to spatial organization can be combined into a framework of ideas suitable for learning about places.

Most phenomena are arranged in the earth's surface in distinctive, orderly ways. These arrangements are called spatial distributions. Being able to recognize and describe spatial distributions is part of geographic learning. For instance, in their study of a western state, children may discern that the population is aligned along routes of transportation, clustered around natural resources, and concentrated in the southern portion of the state. They also may discover regularities in the distribution of crops, land use, climate, towns, and so forth. Spatial distributions of various phenomena exist at every scale in every setting; hence, opportunities to teach and learn the idea of distribution exist at all grade levels.

When we raise the question of why a particular distribution is arranged as it is, we are asking about associations. An association is said to exist when one or more distributions are used to predict or explain another distribution. For young children it may be that some associations are too complex but many associations are not out of the range of understanding of children. In the earlier example of population distribution in a western state, two simple associations were implied: the association between population distribution and transportation routes and the association between population clusters and the location of natural resources. Obviously, transportation and resources are not the complete explanation for why these people live where they do, but they certainly are important parts of the explanation.

Movement between places is called spatial interaction. Physical phenomena such as tides and glaciers have always moved across the earth's surface and, of course, so have people and their cultures. But modern transportation and telecommunication have accelerated the rate, increased the range, and amplified the impact of movement. Thus, understanding the twentieth century entails understanding spatial interaction.[16] Within the realm of population children might learn about migration, the movement of people from place to place. Immigration to North America is an obvious example, but other kinds of "people movement," such as commuting and vacationing, should not be ignored. From the environment comes the movement of matter and energy within the various physical systems; examples suitable for children are river systems and weather systems. Spatial interaction between different societies is most obvious in trade, the movement of goods from place to place. Trade occurs, of course, at local, regional, national, and international scales; hence, children are studying trade when they examine shopping at the supermarket, the flow of iron ore to Gary, Indiana, or the importation of automobiles from Japan.

Changes occurring in systematic, describable ways are called processes.[17] Some processes, such as biologic and geologic processes, are slow to effect discernible changes but their impact on earth is profound; consider, for instance, plate tectonics, or "continental drift," as it is sometimes called. Other processes, such as the diffusion of innovation, occur over shorter spans of time and are more readily observed. For instance, the spread of modern technology, ranging from transistors to nuclear reactors, has altered profoundly the lives of many people. Processes concern both the past and the future of places. The impact of the past on the geography of the present is evident in houses, street and field patterns, transportation modes and routes, stage of economic development, and so forth. Processes, physical as well as social, also create the geography of the future. Here children can learn to anticipate the outcomes of certain processes through activities such as weather forecasting and to understand how other processes are affected through activities such as urban planning. The study of processes unifies the past, present, and future of places.

3.0 Children Should Learn Basic and Practical Spatial Competencies[18]

Skills range across many domains of learning and areas of curriculum. Currently, the educational literature mentions not only reading, writing, and arithmetic skills, but also human relations skills, critical thinking skills, and career selection skills, to mention only a few. Underlying these diverse skills are two unifying ideas:

1. Being skillful means being able to act effectively and efficiently.
2. A necessary condition for effective and efficient action is the ability to process information.

Acting effectively and efficiently in geographic settings is spatial competence. Spatial competence consists of such abilities as locating and orienting objects in space, adopting alternative perspectives of geographic phenomena, constructing appropriate models of portions of the earth's surface, and interpreting symbolic representations of places. Spatial competence is reflected in many activities, including toy play, games, and orienteering.[19] Such activities can and should be used to develop spatial competence. For example, younger children can construct and use simple models and maps of their classroom, school, and community. Older children can map such distributions as population density and income. Younger children can learn to read simple maps of their school, neighborhood, and community, while older children can develop their map-interpretation skills by using road maps, atlas maps, topographic maps, and of course, the globe. Whatever the level or activity, four notions are central to spatial competence: location, direction, scale, and symbol.

3.1 Children Should Learn to Use Locational Systems. Maps are used to record and display the location of phenomena by means of coordinate systems. Both map making and map using depend on an ability to utilize a coordinate system in order to establish correct locations. The plane coordinate system is familiar to users of city street maps and state highway maps; it can be taught to young children through devices such as seating charts and bingo games as well as maps themselves. The spherical coordinate system is more complex and should be reserved for older children because understanding the latitude/longitude scheme depends on recognition of the properties of a sphere.[20] Such understanding is best facilitated through study of the globe.

3.2 Children Should Learn to Use Direction Systems. Direction refers to the orientation of phenomena on the earth's surface. Orienting or aligning phenomena properly is an important part of map making, just as ascertaining which way to go is an important part of map using. Pattison identifies three direction systems to be emphasized in elementary schools: personal, environmental, and global.[21] Personal directions emanate from the individual and use terms such as left and right. Environmental directions derive from objects in the environment and use words such as toward, away, and around. Personal and environmental directions are rarely used in connection with maps, but they are important in helping young children develop spatial competence. Global directions derive from fixed points on the earth's surface, that is, the north and south poles. This direction system is more complicated and should be reserved for the upper elementary grades.[22] All geographic learning should be related to the "real" world, but it is especially important to connect global directions with the immediate local environment. This can be done through such activities as compass traverse, field orienteering, and map orientation.

3.3 Children Should Learn How to Use Scale Systems. Maps are reductions of the earth's surface and a map scale specifies the proportional relationship between the map and reality. The notation of proportional relationships can be introduced to young children by focusing their attention on ideas reflected in terms such as larger, smaller, nearer, and closer, particularly when they are constructing simple models of home, school, and neighborhood. Later, children can begin learning to use more formal versions of map scale, such as verbal scales and bar scales. Representative fractions, or ratio scales, in our opinion, should be deferred at least until middle school.

3.4 Children Should Learn How to Use Symbolic Systems. Just as words represent realities, so, too, do map symbols. Just as young children should learn to use certain words in lieu of certain realities, so, too, they should learn to use certain map symbols in lieu of certain geographic phenomena. This approach implies that maps are a medium of communication and intimates a similarity between learning to read and write and learning to interpret and make maps.

Children should learn to construct and interpret three types of map symbols. Point symbols represent specific places, such as cities, and particular features, such as churches. Line symbols signify connections between two or more points. Line symbols range from a series of dots representing political boundaries to arrows of various widths representing different flow volumes. Area symbols represent the extent of some geographic phenomenon. Climatic types and land-use patterns are two phenomena ordinarily represented by area symbols.

4.0 Children Should Learn Powerful and Practical Ways of Thinking About Places

Different ways of thinking are employed for different purposes. Two ways of thinking might be called "investigation" and "problem solving." Neither way of thinking is peculiar to geography, but both can be developed through the study of places.

4.1 Children Should Learn to Investigate Places. Put most simply, investigation means seeking answers to questions about the world in which we live. Being capable investigators of important and perplexing questions is an especially important competence for citizens living in a changing society where traditional answers sometimes fail and novel questions continually arise. Ideally, investigation begins with questions that are personally and socially relevant. These questions often arise in contexts such as the neighborhood, the community, and the nation, topics commonly examined in the elementary school. Investigation continues by collecting information and acquiring experience relevant to the questions. Information can come from a variety of sources, including interviews, observations, photographs, books, and resource people. This stage of investigation also implies direct, firsthand, on-site experiences, which geographers call "fieldwork." Although much meaningful learning is vicarious, symbolic, and mediated, fieldwork, involving immediate contact with the phenomena being investigated, is extremely important for children.[23]

> It is sometimes revealing to ask older town-dwelling pupils . . . to make a mark on a wall representing the height of a fully grown dairy cow. If the youngsters do this independently so that they are not affected by each other's attempts, a quite astonishing range of answers often results. It is not unreasonable to suggest that there is something amiss if youngsters who can write quite convincingly . . . about the dairy industry . . . cannot indicate the size of the animals concerned, nor is it so unreasonable to regret that they have, apparently, never visited a farm or looked closely at a cow.

The third step involves organizing the information in formats that lend themselves to interpretation. For the geographer, a traditional means of organizing information has been the map, an ideal way to display information in a spatial format. Map making should be a part of the elementary school program, but only insofar as it facilitates children's ability to organize information relevant to their investigations. Beyond map making, children should also learn to organize and interpret information in such forms as tables, charts, and graphs, as well as collages, reports, and scenarios. Although these devices are not peculiarly geographic, they are used frequently by geographers to organize information about places.

Finally, the information must be interpreted and evaluated in terms of the light it sheds on the question at hand. Definitive answers may be found occasionally, but more often, partial or even inadequate answers result. Nonetheless, a properly conducted investigation culminating in a less-than-satisfying answer is valuable from an educational point of view because children will have learned more about the investigatory process.

4.2 Children Should Learn to Analyze the Problems of Places. Learning to analyze problems is part of one's intellectual and social development. The problems children encounter range from the frequent, simple difficulties associated with everyday life to the enduring, pervasive social issues confronting society. But whatever their scope and complexity, problems are part of the human experience, and children should begin learning how to deal with them.

A simplified version of problem analysis is shown in Figure 10.1. Problems exist when there is a gap between the way things are and the way we wish things to be. Invoking knowledge about the problem is an important part of the process, but so is a consideration of the values, that is, what we want. Choice, or decision, may follow consideration of a problem, but the problem analyst also may conclude that no action can, or should, be taken.

Like investigation, problem analysis ideally begins with a problem that is personally relevant and socially significant. Such problems may originate in children's experiences or they may be introduced by the teacher; among likely problem themes relevant to places are environmental degradation, resource utilization, and land-use conflicts. The initial stage of problem analysis consists of exploring the problem. It is here that a major link between problem analysis and investigation, particularly fieldwork, is evident. Problems are "real world" phenomena and they can be appreciated only to the extent that they are seen, heard, smelled, and so forth.

A problem experienced is not a problem comprehended; hence, another stage of analysis is the acquisition of knowledge concerning the problem. Here, facts and ideas about the causes, characteristics, and consequences of the problem are principal concerns. Particularly important is knowledge that not only accounts for the origins of the problem but also can be applied in efforts to resolve it. In other words, the knowledge should have "problem-solving potential."

Most problems involve values and value conflicts. Values are ideas about what is important. Problems often originate in disagreement about what is most important. Two phases of value analyses are suitable for elementary school children—value awareness and value comprehension. Value awareness refers to the recognition of the values, personal as well as social, present in a problem situation.[24] Developing value awareness in children is essential because they may not recognize the fact that all people do not necessarily value the same things in the same way, and consequently, problems may result. Value comprehension differs from value awareness in that comprehending a value requires knowledge of the reasons and experiences underlying that value.

Problem solving implies decision and action, the final phase of the process.[25] Essentially, decision and action mean deciding what to do about a problem, then going ahead and doing it. Quite obviously, there are numerous constraints on decision and action, including feasibility, cost, maturity, and controversy. But children can learn to choose from among alternative solutions to a problem after a careful consideration of the consequences, even if the decision is made in a simulated setting. On occasion children can try to implement their proposed solutions to problems, especially if the problem only concerns the classroom, school, or neighborhood.

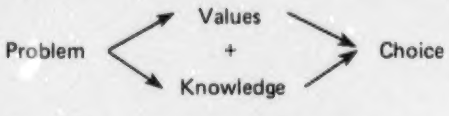

Figure 10.1. A problem solving model.

Part 3: Evaluating Geographic Education

To what degree have the students in a particular class achieved the objectives presented in this paper? To what degree do the teachers in a particular school provide opportunities for geographic learning? To what degree are the instructional materials used in a particular district contributing to the teaching and learning of geography? The need for answers to questions such as these prompted the development of the checklist in Table 10.1.

TABLE 10.1
Checklist for Evaluating Geographic Education

Rating	Item	
	1.0	Facts about places
3 2 1 0	1.1	Can students identify and describe place locations?
3 2 1 0	1.2	Do teachers provide opportunities for children to learn place locations?
3 2 1 0	1.3	Do instructional materials contain adequate and accurate descriptions of places?
	2.0	Geographic ideas
3 2 1 0	2.1	Do the students understand the ideas of environment, population, organization, and technology? Do they understand how these ideas are related to one another?
3 2 1 0	2.2	Do the students understand the ideas of distribution, association, interaction, and process? Do they understand how these ideas are related to one another?
3 2 1 0	2.3	Are the teachers focusing instruction on specific concepts and generalizations emanating from population, environment, organization, and technology?
3 2 1 0	2.4	Are the teachers aiming instructional activities at specific concepts and generalizations related to spatial patterns, spatial movements, and spatial changes?
3 2 1 0	2.5	Are the instructional materials presently in use designed around the geographic ideas outlined in this paper? If not, can these materials be used to develop these ideas?
	3.0	Spatial competence
3 2 1 0	3.1	Can students use maps in the field as well as the classroom?
3 2 1 0	3.2	Do teachers provide systematic training in map making as well as map using?
3 2 1 0	3.3	Are adequate types and amounts of maps, atlases, and globes, as well as map-related instructional materials, available in classrooms?

TABLE 10.1 (con't.)

Rating	Item
	4.0 Intellectual processes
3 2 1 0	4.1 Can the students conduct a satisfactory investigation of questions related to places?
3 2 1 0	4.2 Can the students suggest feasible, reasonable solutions to geographic problems? Can they make informed, responsible decisions about geographic problems?
3 2 1 0	4.3 Do teachers use fieldwork in their teaching?
3 2 1 0	4.4 Do teachers provide problem-solving and decision-making experiences?
3 2 1 0	4.5 Are the instructional materials designed for investigation-oriented and problem-oriented learning?

Evaluation is an extremely important part of the educational process, but it is also complex and time consuming. This checklist does not replace achievement tests, classroom observation, materials analysis, or any other way of collecting evaluation data. Instead, the checklist should be used as a guide and stimulant for ascertaining the status of geographic education in a classroom, school, or district. The judgments requested are subjective and crude, but thoughtful and careful educators will, upon reflection, be able to establish a reasonably good idea about the quality of their program by trying to answer the checklist questions.

Each question derives from the objectives stated in Part 2 of this paper. Like the objectives, the questions are to be interpreted as K-6 program outcomes. More useful, however, would be grade-level specifications for each question; for instance, precisely which places should a second grader be able to locate, or exactly what kind of map should a fifth grader be able to use. Specifying guideline questions for different grade levels not only will make evaluation easier, at least in the long run, but also will clarify the curriculum implications of this paper for children of different ages and grades.

To use the checklist, simply circle the rating for each specific item according to the following informal scale:

3 = Superior; Excellent; Hard to Improve
2 = Good; Better than Average; Some Improvement Possible
1 = Fair; Average; Much Improvement Possible
0 = Poor; Below Average; Anything Would Be An Improvement

You may wish to sum the ratings into subscores and total scores, but we recommend greater emphasis be placed on the processes of arriving at a particular rating and deciding on the implications of a rating.

Part 4: A Bibliographic Essay

This brief bibliography is intended for persons who are interested in learning more about geographic education but who are not specialists in the field. We have consulted all the sources listed, but we do not claim our positions and interpretations always correspond with the various authors listed. We urge that users of this paper consult these, as well as other sources of information on geographic education.

Geography in the Elementary School

The story of the United States elementary school is fascinating. As a starting point, we suggest *The Elementary School in the United States,* especially Chapters 2 and 3.[26] *Perspectives on Curriculum Development: 1776-1976* provides a succinct historical overview of curriculum change in the United States during the last two centuries, with several chapters focused on the relationship between school and society.[27] Definitive studies of geography's role in elementary education during those years are lacking, but James' "The Significance of Geography in Elementary Education" and Vuicich and Stoltman's *Geography in Elementary and Secondary Education: Tradition to Opportunity* are helpful.[28]

It was not only the schools that changed during the first two centuries of the American experience, for geography itself also changed. James' *All Possible Worlds* provides a comprehensive survey of the evolution of the geographic discipline, while *Geography Now and Then* by William Warntz examines geography in the United States during the eighteenth and nineteenth centuries.[29] For statements on the nature of "contemporary" geography, see *Geography as a Fundamental Research Discipline* and *The Science of Geography;* however, the clearest brief response to the question, What is geography? is Pattison's "The Four Traditions of Geography."[30]

Schooling and the disciplines intersect in the curriculum. This paper rests on a conception of curriculum first described by Ralph Tyler in *Basic Principles of Curriculum and Instruction* and subsequently elaborated by Hilda Taba in *Curriculum Development: Theory and Practice.*[31] (We are aware of some limitations and criticisms of this conception, particularly those collected in Pinar's *Curriculum Theorizing.*[32]) Central to the Tyler-Taba model of curriculum are goals and objectives. Goals for the elementary school are reviewed in Bruce Joyce's *Alternative Models for Elementary Education;* goals for social studies education are considered in *New Strategies for Social Education;* and goals for geographic education are examined by William Pattison in "The Educational Purposes of Geography."[33] Those interested in how to operationalize goals into specific objectives should consult Clegg's "Developing and Using Behavioral Objectives in Geography."[34]

But what about the children: can they learn geography? Is geography relevant to their developmental needs and status? Answers to these questions are complex, but some excellent work has been done, including Mitchell's classic, *Young Geographers.*[35] More recent discussions, some relating Piaget's work to spatial learning, are Hanna's *Geography in the Teaching of the Social Studies,* McCartin's "The Cognitive and Affective Learning of Children," and "The Development of Spatial Cognition" by Hart and Moore.[36]

Objectives for Geographic Education

Defining places as distinctive areas of the earth's surface raises the issue of regions and regionalizing, which essentially means delineating areas of the earth's surface in some systematic way. A good introductory discussion of this topic is Kohn's "Regions and Regionalizing" which includes examples from a fourth-grade textbook.[37] A more comprehensive, integrative approach to the study of regions is "Approaches to Regional Analysis" by Brian Berry.[38]

Location, a principal attribute of places, is a topic that has generated a voluminous geographic literature. We recommend the informal approach taken on pages 7-9 of Peter Haggett's *Geography: A Modern Synthesis*; indeed Chapter 1 provides an excellent overview of geography and the study of places.[39] What are places "really" like? This question can be answered in two ways: regionally and topically. Among sources of regional information that teachers may find useful *Regional Geography of the World* and *North America: A Geography of Canada and the United States*.[40] Sources of information about places that are organized topically are *Human Geography* and *A Geography of Mankind*.[41] Obviously, these should be supplemented with periodical material such as *Focus*, published by the American Geographical Society.[42]

The classic statement on maps and mapping in the classroom is Pattison's "Territory, Learner and Map."[43] Educators interested in learning more about maps and mapping might examine Tyner's *The World of Maps and Mapping*, Greenhood's *Mapping*, and Robinson and Sale's *Elements of Cartography*.[44] The links between map skills and spatial cognition have yet to be made explicit. Among the sources relevant to this question are "Studies in Geographic Learning," Piaget and Inhelder's *The Child's Conception of Space*, and *Children's Spatial Development*.[45]

The population-organization-environment-technology framework, sometimes called the POET scheme, is summarized in Duncan's "From Social System to Ecosystem."[46] Geographic applications are presented in Zelinsky's *A Prologue to Population Geography*, especially Chapters 5-12, and his *Cultural Geography of the United States*.[47] For elementary teachers, the May 1970 issue of the *Journal of Geography* contains several examples of lessons built around the POET scheme.[48]

The spatial perspective may puzzle nongeographers. For a provocative introduction, see *An Invitation to Geography*, especially the chapter "Geography in Everyday Life."[49] Other sources, somewhat more technical, are *Spatial Organization; Man, Location, and Behavior;* and *Geography as Social Science*.[50] At the elementary school level, most applications of the spatial perspective concern the city; for example, the May 1969 issue of the *Journal of Geography* contains several articles on spatial aspects of the city.[51]

Helping children learn to think via investigations of geographic phenomena is well exemplified in Crabtree's "Supporting Reflective Thinking in the Classroom."[52] Ideas for investigations of the local community abound in *The Local Community: A Handbook for Teachers* and "Teaching Geography Out-of-Doors."[53] Although it is written for a college-level course, Hill's "Learning Geographic Concepts in the Local Area" is an excellent example of how to integrate ideas and investigation.[54]

Problems that can be examined from a geographic perspective are numerous. A good source of ideas is the McGraw-Hill *Problems in Geography Series,* which includes such titles as *The Geography of Crime and Justice, The Geography of Poverty,* and *The Geography of Social Well-Being in the United States.*[35] The *Instructional Activities Series* published by the National Council for Geographic Education contains several examples of how social problems are handled in the elementary classroom.[36] Value analysis has not generated much geographic literature, although the values concept is implicit in many areas of geographic inquiry, such as environmental perception, land use, and resource policy. Teachers will find Martorella's "Teaching Geography Through Value Strategies" and Kracht and Boehm's "Feelings About ths Community" are excellent sources of ideas.[37] Note also the publication by Cole listed above. Decision making and the future are even more novel themes for both geography and education. *Spatial Organization* does provide in Chapters 12 and 13 an interesting discussion of decision making, and *Human Geography in a Shrinking World* is a fascinating collection of essays on geographic futures.[38]

Evaluation in Geographic Education

Two comprehensive discussions of evaluation are *Handbook on Formative and Summative Evaluation of Student Learning,* which emphasizes learner evaluation, and *Evaluation in Education,* which stresses curriculum evaluation.[39] Student evaluation in geographic education is examined thoroughly in *Evaluation in Geography* and "Evaluation of Geographic Learning in the Elementary School."[40] Additional examples of achievement test items may be found in Kurfman's "Evaluating Geographic Learning" and "An Assessment of the Geographic Learning of Fifth-Grade Students in Michigan" by Bettis and Manson.[41] And what about instructional materials? We are not aware of comprehensive, systematic evaluations of the geography contained in the various materials used in the elementary schools, but we do recommend the study completed by the Joint Council on Economic Education, *Economics in Social Studies Textbooks,* as an example of what can be and probably should be done by geographic educators.[42]

NOTES

1. "Geography a Century Ago," *Journal of Geography,* vol. 32 (Oct. 1933), p. 298.
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3. See Chapter 4 of this volume.
4. Daniel Tanner and Laurel Tanner, *Curriculum Development: Theory into Practice* (New York: Macmillan Co., 1975).
5. Frederick A. Rogers, *Curriculum and Instruction in the Elementary School* (New York: Macmillan Co., 1975).
6. Bruce R. Joyce, *New Strategies for Social Education* (Chicago: Science Research Associates, 1972).
7. Dana G. Kurfman, "Educational Developments Useful in Geographic Education," in *Evaluation in Geographic Education,* ed. Dana G. Kurfman (Belmont, Calif.: Fearon Publishers, 1970), pp. 4-11.
8. Robert N. Saveland and Clifton W. Pannell, "Recent Research in Geographic Education in

the United States," presented at the 1976 Annual Meeting of the National Council for Geographic Education.

9. Adapted from *Advisory Paper for Teachers Associated with the High School Geography Project* (Boulder, Colo.: University of Colorado, 1962), pp. 21-23.
10. Ibid.
11. Marlin L. Tanck, "Teaching Concepts, Generalizations and Constructs," in *Social Studies Curriculum Development: Prospects and Problems*, ed. Dorothy McClure Fraser (Washington, D.C.: National Council for the Social Studies, 1969), p. 101.
12. Edward J. Taaffe, "The Spatial View in Context," *Annals of the Association of American Geographers*, vol. 64 (March 1974), pp. 1-16.
13. J. E. Spencer and William L. Thomas, Jr., *Cultural Geography* (New York: John Wiley & Sons, 1969), pp. 110-12.
14. Richard Morrill, *The Spatial Organization of Society* (Belmont, Calif.: Wadsworth Publishing Co., 1970).
15. Adapted from Chapter 2 of this volume. Also see Edwin N. Thomas, "Some Comments about a Structure of Geography with a Particular Reference to Geographic Facts, Spatial Distribution, and Areal Association," in *Selected Classroom Experiences: High School Geography Project*, ed. Clyde F. Kohn (Normal, Ill.: National Council for Geographic Education, 1964), pp. 44-60.
16. Jan O. M. Broek and John W. Webb, *A Geography of Mankind*, 2nd ed. (New York: McGraw-Hill Book Co., 1973), pp. 17-18.
17. Frederic R. Steinhauser, "The Study of Geography" (unpublished and undated manuscript).
18. William D. Pattison, "Teaching of Geography: Elementary Schools," *Encyclopedia of Education*, vol. 4 (New York: Macmillan Co. and Free Press, 1971), pp. 114-19.
19. Orienteering, an activity of Swedish origin, is "a competitive exercise in which participants find their way along a predetermined course using a map, compass, and perhaps a series of teacher-supplied clues. The objective is to find the shortest route around a series of control points." Michael Jacobson and Stuart Palonsky, "School Camping and Elementary Social Studies," *Social Education*, vol. 40 (Jan. 1976), pp. 44-46.
20. Judith M. W. Myer, "Map Skills Instruction and the Child's Developing Cognitive Abilities," *Journal of Geography*, vol. 72 (Sept. 1973), pp. 27-35.
21. William D. Pattison, *Going Places: Which Way?* (Chicago: Rand McNally & Co., 1965).
22. Myer, "Map Skills Instruction," pp. 27-35.
23. Eric J. Barker, *Geography and Younger Children* (London: University of London Press, 1974), pp. 83-84.
24. Richard A. Cole, *A New Role for Geographical Education: Values and Environmental Concerns* (Oak Park, Ill.: National Council for Geographic Education, 1974), p. 1.
25. Ibid., p. 32.
26. John I. Goodlad and Harold G. Shane, eds. *The Elementary School in the United States* (Chicago: University of Chicago Press, 1973).
27. O. L. Davis, ed., *Perspectives on Curriculum Development* (Washington, D.C.: Association for Supervision and Curriculum Development, 1976).
28. Preston E. James, "The Significance of Geography in American Education," *Journal of Geography*, vol. 68 (Nov. 1969), pp. 473-83; and George Vuicich and Joseph Stoltman, *Geography in Elementary and Secondary Education: Tradition to Opportunity* (Boulder, Colo.: ERIC Clearinghouse for Social Studies/Social Science Education and Social Science Education Consortium, 1975).
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30. E. A. Ackerman, *Geography as a Fundamental Research Discipline* (Chicago: University of Chicago, Dept. of Geography, 1958); *The Science of Geography* (Washington, D.C.:

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34. Ambrose A. Clegg, Jr., "Developing and Using Behavioral Objectives in Geography," in *Focus on Geography*, ed. Phillip Bacon (Washington, D.C.: National Council for the Social Studies, 1970).
35. Lucy Sprague Mitchell, *Young Geographers* (New York: John Day Co., 1934).
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42. *Focus* is published by the American Geographical Society.
43. William D. Pattison, "Territory, Learner and Map," *Elementary School Journal*, vol. 66 (1966), pp. 146-53.
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56. *Instructional Activities Series* (Oak Park, Ill.: National Council for Geographic Education).
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